



GUIDELINES FOR DEVELOPING A **State NG911 Plan**

Model plan and tips to facilitate NG911 planning for states and jurisdictions

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RELEASED FOR PUBLIC FEEDBACK

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Executive Summary

911 is in the midst of change—technically, operationally, and culturally. Approaches toward state-level NG911 must keep pace.

The Importance of State NG911 Planning

Since its inception in 1968, the 911 system has come a long way and continues to progress toward meeting the emerging needs of current society—a society that is exponentially different in needs and behaviors than those that accessed 911 services 50 years ago. Technological advancements, population growth and shifts in calling behaviors, and a variety of other factors challenge the nascent system that was born at the local jurisdictional level. Today, an individual’s mobility and ever-expanding access to new communication technologies require the 911 community to think more broadly, expand its reach, and operate with the utmost efficiency.

When looking at the future state of 911 from a bird’s-eye view, it is important to recognize that 911 is moving from approximately *6,000 independent operations* to an *interconnected system* of approximately *6,000 operations*. The National 911 Program refers to this scenario as a “Next Generation (NG) 911 system of systems.” *What does this look like?* It is the 911 community that will drive how an NG911 system of systems is manifested, and this broad concept will be incrementally defined and sculpted jurisdiction by jurisdiction. Jurisdictional transition to innovative NG911 capabilities is essential to reaching the systems of systems vision—state 911 coordinators¹ responsible for planning statewide maturity have a lot of factors to consider.

¹ Titles carried by those responsible for overseeing state 911 systems vary from state to state. Legislative guidance produced by the National 911 Program and the National Association for State 911 Administrators refers to the position generically as the “Executive director” of the state 911 office. However, titles are tailored from state to state and can include 911 Administrator, 911 Program Manager, 911 Coordinator, and 911 Executive Director. For the purpose of this guidance, the individual tasked with oversight on behalf of the state is referred to generically as the state 911 office’s “Coordinator,” regardless of his or her state-given title.

NG911 Capabilities at the Jurisdictional Level

“NG911” services mean a secure, Internet Protocol (IP)-based, open standards system comprised of hardware, software, data, and operational policies and procedures that:

- Provides standardized interfaces from emergency call and message services to support emergency communications;
- Processes all types of emergency call, including voice, text, data, and multimedia information;
- Acquires and integrates additional emergency call data useful to call routing and handling;
- Delivers the emergency calls, messages, and data to the appropriate, PSAP [Public Safety Answering Point] and other appropriate emergency entities based on the location of the caller;
- Support data, video, and other communications needs for coordinated incident response and management; and
- Interoperates with services and networks used by first responders [and other 911 systems] to facilitate emergency response.²

Figure 1 below depicts a jurisdictional³ NG911 environment at a very high, conceptual level. Interactions between components are facilitated by both technical and operational elements, including but not limited to technology hardware/software, and processes and procedures implemented by the 911 workforce.



Figure 1: High-level Abstract View of a Jurisdictional NG911 Environment

² The NG911 description provided represents a definition that was mutually agreed upon by the National 911 Program, the National Emergency Number Association, the National Association of State 911 Administrators, and the Industry Council for Emergency Response Technologies on January 12, 2018.

³ The term “jurisdictional” is used generically to refer to government bodies at various levels. “Jurisdiction” could mean a town, a rural community, or a region within a state.

This Tool's Role in Helping States Plan for NG911 Transition

In 2013, the National 911 Program⁴ and the National Association of State 911 Administrators (NASNA) published the resource titled, *Model State 911 Plan*—a tool intended to:

- Help state 911 coordinators understand the breadth and depth of components that are included in an ideal state 911 plan; and
- Provide examples of a variety of resources, including:
 - Models for state coordination and collaboration,
 - Methods for overseeing and managing a state 911 system,
 - Mechanisms for establishing and monitoring system progress,
 - Mechanisms for allocating funding to Public Safety Answering Points, and
 - Methods by which PSAPs could integrate with other emergency communication, telecommunications and information networks.

Since it was published, the *Model State 911 Plan* has helped state 911 coordinators and their staffs develop or enhance their planning. However, planning is continuously affected by the advent of emerging technologies and other circumstances that continue to evolve at ever rapid rates.

To help state officials address (and facilitate) the shifting landscape of 911, the National 911 Program and NASNA have partnered with private- and public-sector 911 stakeholders to update the *Model State 911 Plan*. This document represents the second iteration (Version 2.0) of the tool and includes new considerations that pertain specifically to NG911 transition. Also included are lessons learned, best practices, and sample plan excerpts that share the direct experiences of state 911 coordinators who have continued to drive statewide transition toward NG911 capabilities. Since new perspectives arise with each step forward, the National 911 Program, NASNA, and their stakeholder partners are committed to updating this resource on a cyclical basis.

Specifically, this guidance strives to help state 911 coordinators:

1. Develop or hone their state's vision, mission, and goals for its 911 system;
2. Understand and articulate any gaps between their state's current 911 system and the state's vision for its future NG911 environment; and
3. Define, articulate, implement, and maintain key aspects of their state 911 program's governance framework, technical and operational systems and procedures, data management and information sharing practices, and evaluation and enhancement approaches.

The role of those involved in developing and establishing state-level NG911 plans is multi-faceted. State 911 coordinators have the roles of both Visionary and Realist and are challenged with shifting the drum beat between the two rhythms as plans are being coordinated, implemented, and enhanced.

⁴The National 911 Program, created by Congress in 2004 as the 911 Implementation and Coordination Office (ICO), is housed within the National Highway Traffic Safety Administration at the U.S. Department of Transportation and is a joint program with the U.S. Department of Commerce National Telecommunication and Information Administration. Further information can be found at <https://www.911.gov>.

The National 911 Program, NASNA, and the many partners who contributed to development of this updated guidance hope that state 911 coordinators find its content helpful. Success will be measured by any contribution this document makes toward helping 911 coordinators and PSAP managers develop plans that result in:

- Redefining and broadening the roster of engaged stakeholders who are typically thought to comprise the 911 community;
- Helping forge new (and strengthen existing) jurisdictional partnerships; and
- Closing the divide between public and private sector 911 interests.

Contributors

The National 911 Program and NASNA would like to thank the following individuals who, on behalf of their organizations, worked tirelessly to develop and socialize Version 2.0 of this guidance.

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- Brian Fontes, Chief Executive Officer, National Emergency Number Association (NENA)
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The completion of this document would not have been possible without the generous contribution of their experience and expertise.



CHAPTER 1: About the Guidance

Who Should Use this Guidance

While *Guidelines for Developing a State NG911 Plan* may serve as a useful reference for many across the 911 community, its use is specifically geared toward those responsible for developing and implementing NG911 plans for a given U.S. State, Commonwealth, or Territory(ies)⁵. Key users of this guidance can be categorized across the stakeholder groups are described in Table 1.

	Stakeholders	Relevant Role	Relevant Use of Guidance
Primary	The state’s 911 coordinator and members of the state 911 advisory board	Responsible for designing and maintaining state NG911 plans and all aspects of coordinating and managing NG911 implementation activities	<ul style="list-style-type: none">• Ability to articulate their understanding of the depth and breadth of activities involved in establishing and operating an effective statewide 911 system• Access and ability to adapt to best practices and lessons learned by others who have developed and implemented plans
Secondary	Directors of state offices responsible for planning, procurement, implementation, operations, or delivery of resources involved in 911	Responsible for ensuring 911-relevant resources and/or responsibilities within their domain are compliant with 911 legislation	<ul style="list-style-type: none">• Ability to obtain understanding of the importance of their involvement in 911 service delivery• Access to a framework upon which they can collaborate with state 911 office authorities (during planning, implementation, and operations) on how to most effectively procure, deploy, and maintain 911-supportive services that reside under their domain
Tertiary	State legislators, legislative staff, and the state Governor	Ultimately accountable, as state policy leadership, for program funding and ensuring quality 911 services are provided to communities throughout their state	Ability to reference the level of compliance between the components of the state NG911 plan and state 911 legislation, and address any discrepancies

Table 1: Stakeholders Who Can Benefit from Guidance

⁵ For the purpose of this guidance, the term, “state,” will be used when referencing any such entity.

How to Use this Guidance

The format of *Guidelines for Developing a State NG911 Plan* is intended to be user-friendly and is presented as a balance of “how-to” guidance and sample content punctuated with best practices and lessons learned. Each chapter reflects a component of an ideal state NG911 plan and chapters are sequenced in alignment with how they are recommended to appear in your state plan. **Of course, every state is different, therefore tips have been provided on how to modify and adapt your plan to fit your state’s specific needs. One size does not fit all!**

Structurally, the guidance includes the following two sections for each plan element:

1. **Considerations & Best Practices.** This section identifies items that may be appropriate to include in your state plan and contains best practices and links to references that provide further context and guidance.
2. **State Examples.** In this section, you will find examples of how some states have addressed plan components.

To help provide additional context, a glossary of widely adopted terms and concepts is included as [Appendix 1: 911 Terms & Definitions](#). To provide additional reference points for who you can contact for more information on 911 factors, key 911 stakeholder entities are listed in [Appendix 2: Associations, Organizations & Other Stakeholder Entities Relevant to 911](#). Also provided throughout the guidance (and in [Appendix 3: Useful Resources](#)) are links to reference material and resource repositories that address various topics on the background of 911 and NG911; 911-related regulations and policies; topic-specific findings and recommendations compiled by 911 stakeholder committees, workgroups, task forces, and professional associations; and other key sources of information that may be useful. **BUT FIRST, spend some time with the checklist in Chapter 2!**



A VARIETY OF NATIONAL RESOURCES

- FCC TFOPA [Adopted Final Report](#)
- TFOPA Working Group 1 Supplemental Report—[Optimal Cybersecurity Approach for PSAPs](#)
- TFOPA Working Group 2 Supplemental Report—[Phase II Supplemental Report: NG9-1-1 Readiness Scorecard](#)
- TFOPA Working Group 3 Supplemental Report—[Funding Sustainment Model](#)
- National 911 Program [State Assessment Handbook: A Guide for States Participating in the Statewide 911 System Assessment Process](#)
- National 911 Program [State Assessment Guidelines Synopsis Chart](#)
- National 911 Program [Next Generation 911 \(NG911\) Standards Identification and Review](#)
- National 911 Program [Next Generation 911 \(NG9-1-1\) Interstate Playbook, Chapter 1](#)
- National 911 Program [Next Generation 911 \(NG9-1-1\) Interstate Playbook, Chapter 2](#)

A VARIETY OF STATE PLANS, STUDIES & REPORTS

- District of Columbia Fire and Emergency Medical Services (EMS) Department [Integrated Healthcare Collaborative Final Report](#)
- State of California [NG9-1-1 Transition/Implementation Plan](#) and [Routing on Empirical Data \(RED\) Project Summary](#)
- State of Illinois [Next Generation 9-1-1 Feasibility Study](#)
- State of Indiana [Statewide 9-1-1 Plan](#)
- State of Iowa [Wireless NG911 Implementation and Operations Plan](#)
- State of Maryland State Plan
- State of Michigan [State 911 Plan](#)
- State of Minnesota [Next Generation 9-1-1 Strategic Plan](#) and [Statewide Emergency Communications Board \(SECB\) 2016 – 2018 Strategic Plan](#)
- State of Nebraska [Next Generation 911 Master Plan](#)
- Commonwealth of Pennsylvania [Statewide 9-1-1 Plan](#)
- State of South Dakota [State 9-1-1 Master Plan](#)
- State of Tennessee [Strategic Plan](#)
- State of Utah [911 Strategic Plan](#)
- Commonwealth of Virginia [Statewide 9-1-1 Comprehensive Plan](#), [Next Generation 9-1-1 Deployment Plan](#), and [Virginia GIS Strategic Plan 2015-2020](#)
- Northern Virginia (NoVA) Fire and EMS Assessment [Phase I Gap Analysis Report](#) and [Phase II Gap Analysis Report](#)

Before You Get Started!

Key Considerations!

Developing your state's NG911 plan is as strategic as it is pragmatic. It is essential to know where your state's jurisdictions are along their own paths toward NG911 capabilities, how their collective status translates to where your state sits within the NG911 maturity model, the challenges jurisdictions face, and the ways by which you are able to help them overcome any barriers. Navigating the planning and implementation process takes strategic savvy in relation to timing, communications, and partnership building. The key considerations that follow will help you anticipate barriers and prepare your strategies for how to minimize them.

✓ Your state NG911 plan wears many hats.

At its foundational level, a plan enhances the effectiveness of your 911 system and helps you continuously improve the 911 services your state's local 911 jurisdictions provide to their communities. At the strategic level, the plan and its formation are also a marketing piece, a debate platform, and a tool that can be used to garner support from the various tiers of stakeholders who have the influence to impact 911 funding and/or operational success—with stakeholder tiers spanning from your state legislators to your state residents/911 service consumers. Having a comprehensive, thoughtful, and achievable state NG911 plan demonstrates that you have a serious job to do, the direction is clear, and the successful outcome is planned and achievable. It also highlights the mutual value and business propositions for all stakeholders involved. Your state's NG911 plan should underscore that its success is a benefit to all.

186 ✓ **The planning process involves a lot of research and outreach.**

187 The state’s planning process includes the following key activities (which are described in further
188 detail throughout this guidance):

- 189 • Gathering information and opinions from 911 stakeholders (via surveys, interviews,
190 meetings, and other mechanisms);
- 191 • Establishing a planning task force consisting of stakeholders;
- 192 • Conducting a baseline assessment of current infrastructure, technology, inventory of
193 emergency services, inter-jurisdictional agreements, and funding;
- 194 • Analyzing 911 services data and identifying goals and objectives;
- 195 • Determining success measures; and
- 196 • Soliciting submission of, and reviewing and approving local and regional plans, budgets,
197 and/or financial projects.

198 **Focus Your Energy!**

199 You will find no shortage of material to sift through during your research efforts. Be sure identify what is most important
200 to you and your state’s unique environment and needs.

201 ✓ **Your keys to success are strong vision, mission, and goals statements for your**
202 **state’s 911 system.**

203 As with any initiative, program, or project, a well-defined and achievable end-state is key to
204 developing a workable plan and plotting the necessary milestones. Even more important is
205 obtaining buy-in from the right partners and influencers. With buy-in and support at this early
206 stage, you can be assured that support will continue through implementation of the plan elements
207 as you progress down the road.

208 **Another Key to Success—Flexibility!**

209 While it is essential to craft a strong vision, mission, and supporting goals, be sure to stay flexible and adaptable as you
210 move forward. You may find the need to make adjustments to address changing needs and unforeseen circumstances.
211 Stay nimble and agile!

✓ **Your state's current 911 legislation will drive many of your directions.**

Consider the laws with which your state NG911 plan must comply, and view the documentation for yourself—take care not to rely on word of mouth! Reviewing the language of current statutes and regulations is an important initial step. The National Conference of State Legislatures (NCSL) maintains the [State 9-1-1 Bill Tracking Database](#) (which is maintained in partnership with the U.S. Department of Transportation [DOT] National Highway Traffic Safety Administration [NHTSA]) and contains legislative language for the 50 states and the District of Columbia. It is updated on a weekly basis and as new measures are passed. You can also typically find legislation through your state's website or by contacting your state's legislative body or legal support team.



✓ **Understand Federal 911 regulations.**

Over time, the Federal Government has issued a variety of laws, regulations, and programs that either require or encourage baseline capabilities or activities in support of strengthening local, state, and regional public safety approaches, coordination of emergency communications, and the establishment of 911 services. Consider federal perspectives and directions, not only for the purpose of identifying areas that require state-federal alignment, but also to become aware of any conflict that may exist across federal expectations, state expectations, and what states and their localities are positioned to accomplish. Additionally, an understanding of federal laws, regulations, and programs is a key enabler to identifying any opportunities to apply for federal funds and support. Refer to [Appendix 3: Useful Resources](#), for links to key reference documents.

✓ **There are resources that can help you assess the current capabilities of your state's 911 system and measure how close you are to progressing toward the next stage of enhanced services.**

There are many factors and assets that comprise your state's 911 system and there are resources to help you identify and understand them. It helps to have baseline visibility on your overall landscape (e.g., the number of PSAPs in your state and how they are managed), technical factors (e.g., your 911 system architecture), and operational practices (e.g., procedures for handling the lifecycle of a call) before plotting the "future state" for your system (or at least where you plan for it to be in the next five years).

A great place to start to find out more about where your state currently stands and where it is along its migration path toward NG911 capabilities is the National 911 Program's [National 911 Profile Database](#). The database houses data that help characterize the status of statewide 911 systems. Also useful is the FCC TFOPA [NG9-1-1 Readiness Scorecard](#), which details NG911 capabilities and the five NG911 transitional stages that frame jurisdictional progress, and provides benchmarks for maturity (transitional stages are depicted in Figure 2 below).

Where does your state's system currently fall along the NG911 Transitional Steps continuum? The National 911 Program's [State Assessment Handbook: A Guide for States Participating in the Statewide 911 System Assessment Process](#), is a comprehensive resource that walks you through the assessment process, providing guidance on what to look for and where to find it.

Go to the [National 911 Profile Database](#) for current data and information on state 911 systems!

Go to the [TFOPA NG9-1-1 Readiness Scorecard](#) for information on the technical and operational aspects of NG911 transition stages!

Go to the National 911 Program's [State Assessment Handbook: A Guide for States Participating in the Statewide 911 System Assessment Process](#) for guidance on how to assess your current level of NG911 capabilities!



Figure 2: NG911 Transitional Steps as Identified by the FCC TFOPA

✓ **Consider what motivates your state’s key decision-makers.**

An NG911 plan that is well-poised for support from state decisionmakers requires an understanding of your state’s legislative body. It is helpful to know members, their priorities, and how the body appears to view 911 investments as a whole. It also may prove beneficial to look at any 911-related proposals the body has vetoed or passed (and why). What were the objections or arguments? How was the proposed legislation changed or amended and what drove those changes? Who were the champions? Talk with anyone who can provide insight and strengths to your plan.

✓ **Your partners can open many doors.**

The network of stakeholders with whom you will collaborate to achieve enhance 911 services on a continuous basis is deep and broad. Systems, funds, and services that support 911 service delivery do not always reside under the jurisdiction of the state 911 office. Geographic information systems (GIS), information technology (IT), procurement and training are but a few prime examples of such cross-cutting functions that are integral to NG911 capabilities but are sometimes outside of the administrative control of the state 911 office (and in some cases, authority for a particular function might not exist). Other stakeholders may not be directly involved in the operation of the 911 system, but can be influential advocates (e.g., fire services, groups supporting people with disabilities). Therefore, identifying your partners and including them in the planning process early may prove extremely useful. Not only will you have the benefit of establishing a more comprehensive and practical plan, but you will likely be more successful in obtaining partner buy-in, thus avoiding cross-agency barriers during the implementation phase.

✓ **Consider leaning on those who have been through the planning and Implementation process.**

Other state 911 coordinators are a valuable resource. Find out what they have learned, what they would do differently, who they know, and their recommendations for obtaining buy-in. Reaching out is also a good way to broaden your network, fortify relationships, and build new partnerships. State 911 office coordinators can be found at NASNA’s list, [State 911 Contacts](#).



A Sneak Peak—Portrait of a Plan!

Before diving into the depths of each element of an ideal NG911 plan, it helps to first absorb the big picture—how a successful plan is structured and what it contains. Of course, this framework may need to be adjusted to your state’s environment, not only in content but also in form. For example, depending on your state’s environment, your plan might live as a stand-alone resource or it may need to exist as an accompaniment or supplement to other state strategies; thus, requiring a certain level of conformity. Therefore, while the elements listed below provide a comprehensive list to consider, it may make more sense to include some elements in implementation documents, rules, or operational plans. While your program may not have the responsibility over some items, it may be helpful to understand the impacts they may have on your overall plan. Customize your plan to fit your needs and include elements in supporting documents as appropriate for your state.

Components of a State NG911 Plan



Executive Summary

Introduction

Plan Maintenance

NG911 Roadmap

- Current 911 Environment
- Future NG911 Environment—State Vision, Mission, Goals & Measures
- Sustainable Funding

Program & Operations

- Governance & Organization
- Legislative Process
- Communications Plan
- Operational Standards & Best Practices
- State Call Delivery & Response Process Overview
- Professional Development

Technical Systems

- NG911 Open Standards-based, Compliant ESInet & Core Services
- Call Handling Equipment
- Computer-aided Dispatch
- Mapping System/Geospatial Routing
- Voice/Data Logging Recording
- Radio Systems
- Mobile Broadband Networks
- Citizen Notification Systems
- Clock Synchronization
- Security

Data Development, Maintenance & Support

- Technical System Support
- GIS
- Call Routing & Delivery
- Data Synchronization

Analysis & Planning

- 911 Data Analytics
- Disaster Recovery & Continuity of Operations (COOP)

CHAPTER 3: YOUR STATE PLAN'S Executive Summary

Considerations & Best Practices

The executive summary is just that—a summary of the larger document's key points. It should contain enough information for the reader to become acquainted with the full document without reading it in its entirety. Usually it contains a statement of the problem or purpose, some background information, a description of any alternatives, and the major conclusion.

A state NG911 plan's executive summary:

- Is intended for the upper-level, non-technical manager/administrator;
- **Is written last**, after the body of the plan has been completed. This is due to its purpose to summarize the elements of the plan that are most important, relevant, and necessary for decision-making;
- Is brief: only one to three pages! In many cases, the only thing the policy maker or stakeholder will read is the Executive Summary.
- Does not include information not already presented and supported in the body of the plan.

Include the “Why” & How”!

Tell readers know why you developed the plan and the process you undertook. Explaining who participated, engagement approaches, and the process involved will give the reader confidence that the plan is comprehensive and represents a broad view of where the state should be headed.

Relevance = Buy-in!

The Executive Summary is your first impression and a key to buy-in at all levels. Make sure that your key points and the stated goals and objectives of the plan are relevant to local, regional, state, and national stakeholders.

State Examples

Executive Summary

- Using graphics in your Executive Summary can speak volumes and help avoid the use of burdensome text to explain a concept. For example, the Executive Summary of the Tennessee Emergency Communications Board's (TECB) [Strategic Plan](#) for the **State of Tennessee** contains a graphic to convey their strategic areas of focus and the fact that they correlate with each other and are interdependent.

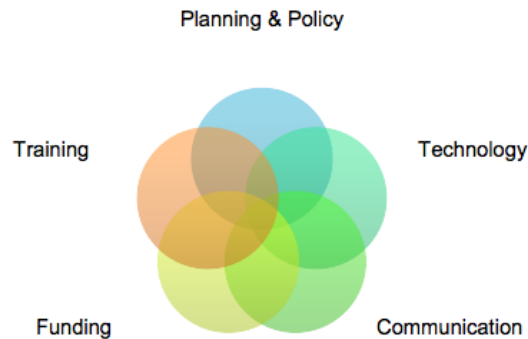


Figure 3: TECB Graphic of Strategic Areas of Focus

- The Executive Summary of the Pennsylvania Emergency Management Agency's (PEMA) [Statewide 9-1-1 Plan](#) for the **Commonwealth of Pennsylvania** describes, in detail, that their authority is derived from legislative action and assures the reader of its role and mission for NG911 pursuits:

“Act 12 makes it possible to enhance emergency communications throughout the Commonwealth which will result in the implementation of advanced technology to emergency services statewide, and to enable public safety professionals to perform their critical role more effectively and efficiently. At the core of the technology evolution will be a Commonwealth-wide migration from legacy 9-1-1 systems to Next Generation 9-1-1 (NG9-1-1) technology, which will make it possible for citizens to communicate with PSAPs via text, video and images, in addition to traditional voice. The anticipated end result will be a 9-1-1 system that provides citizens with unparalleled capabilities to contact emergency services through a variety of communications devices, at any time and from any place within the Commonwealth.”

The Executive Summary also identifies, at a high-level, both near and long-term objectives that will be achieved through collaboration with their PSAP partners:

“The Strategic Plan establishes a vision with a supporting framework of actionable objectives to advance 9-1-1 technological capabilities and associated services. This framework includes processes to:

- o develop and implement uniform policies*
- o incentivize regionalization and shared services*
- o promote education and consistent training*
- o foster collaboration and stakeholder feedback*
- o establish achievable milestones*
- o create a statewide NG9-1-1 enterprise among all stakeholder agencies that is sustainable well into the future”*

CHAPTER 4: YOUR STATE PLAN'S Introduction

Considerations & Best Practices

This section is a brief introduction of the state's plan. It explains why a plan has been developed and its purpose, i.e., how it is intended to be used and by whom. Categorically, you can view your Introduction as containing the following parts:

- A brief overview of the national history and background of 911; and
- A brief overview of the history and background of your state's 911 system—where it stands, its accomplishments over the years, and its key challenges.

Keep in mind that more detailed background information about the history and status of your state's 911 system will appear in your plan's section, *NG911 Roadmap*; therefore, your introduction should be kept brief and high-level. In regard to your overview of the history and background of 911, you may want to refer to content posted by the National 911 Program to commemorate the 50-year evolution of 911. On this web page, you can access a variety of timelines, videos, and articles that describe how 911 came about and has progressed. Resources available were produced by a variety of organizations, including the Association of Public-Safety Communications Officials (APCO), NENA, Cellular Telecommunications Industry Association (CTIA), the Industry Council for Emergency Response Technologies (iCERT), and the 911 Education Foundation.

Back to the Future!

The background section of your plan is a good place to introduce the connection of dots between trends, the vision for NG911, and how your state plans to keep pace with national activity. Consider talking about NG911 transitioning in terms of phases or evolutions of deploying emerging technologies.



State Examples

Introduction

- VITA included the following content In the Background section of the **Commonwealth of Virginia’s** [Statewide 9-1-1 Comprehensive Plan](#) linking the vision with actionable initiatives to demonstrate their commitment to “walk the talk.”

“This Plan articulates the Commonwealth’s 9-1-1 vision, goals, and actionable initiatives. It also aligns with the guiding principles, themes, and several existing resources. The intent is to guide operational, technical, resource, funding, and legislative decisions based on identified needs for advancing 9-1-1 capabilities and services. Included in this Plan is the extension of an invitation to all 9-1-1 stakeholders to take a role in moving Virginia toward its 9-1-1 vision, by actively participating in the goals and initiatives. This Plan also provides stakeholders the ability to measure progress and stay informed about actions being taken to achieve the goals, including initiatives, action plans, and tasks.”

The Insights and Alignment section of plan discusses the previous studies that have influenced or had impact on the current plan. This shows a progression of assessment and the thoughtful processes that have contributed to strategies described in the plan. Furthermore, this section points out the importance of alignment with those plans, stakeholder themes, and the principles outlined in the plan.

- UCA’s [911 Strategic Plan](#) for the **State of Utah** provides a brief background for the reader on the history (nationally) of 911 from its inception in 1968 to enhanced 911 and the advent of mobile devices to NG911. This historical perspective helps the reader understand the progression of service that has occurred and sets the tone for continued evolution of the systems. It also shows that UCA has done their homework! The plan goes on to illustrate the history of 911 in the state and background on the statute and creation of the UCA and how it came to manage 911 services in the state. The state background and history note the legislative action that created the authority and responsibility for 911, along with other related services under the authority of UCA.

- The **State of Michigan’s**, [State of Michigan State 911 Plan](#), includes a national overview of the history and background of 911 as well as an overview and background of 911 in Michigan. Both sections help put the plan in a context of how 911 in Michigan has evolved and grown as trends of the national landscape have also changed.

- PEMA’s [Statewide 9-1-1 Plan](#) for the **Commonwealth of Pennsylvania** goes back to 1990 in describing how the events of that year inspired 911 legislation in the Commonwealth and how its program took shape. Illustrating the underlying rationale for legislation that established authority is helpful in educating and setting expectations.

- The **State of Minnesota’s** [Next Generation 9-1-1 Strategic Plan](#) developed by the state’s Emergency Communications Network (ECN) states that its purpose...

“is to communicate the vision of the Minnesota NG911 System to stakeholders so that they may be actively engaged in its development and deployment. The Minnesota NG911 Strategic Plan presents a Minnesota perspective of the system functionality, management, operations, security and governance required to meet current and future user expectations.”

CHAPTER 5: YOUR STATE PLAN'S Plan Maintenance Section

Considerations & Best Practices

This section might emphasize that your state's NG911 plan is a living document that is intended to be used and modified on an ongoing basis. Plan elements should be monitored for progress and achievement. Describe the monitoring and tracking process and/or structure put into place to achieve that end and address how often the plan will be updated. Ideal review and update cycles will depend heavily on the state's governance environment and how 911 authorities have approached documenting plans for NG911 transition. For example, some states may maintain a single plan that both identifies strategic components *and* serves as the transition implementation tool, while others may have multiple documents, such as an NG911 strategic plan that is separate from an NG911 action plan.

It is also important to identify state 911 office representatives who are tasked with updating the plan (or subsections therein). For example, updates related to documenting progress on existing goals and objectives may be largely administrative and could be handled by program staff. Updates involving major revisions that are more strategic in nature may entail a more formal process and require sanctioning of the state 911 office coordinator (with input from the statewide 911 advisory board). Sharing progress with stakeholders will demonstrate commitment toward continued progress and identify issues that remain to be addressed.

Regardless, consider models for maintaining your plan that align with any other relevant state and/or jurisdictional reporting requirements. Designing maintenance and update procedures that conflict with existing systemic mechanisms might result in a lack of ability to tend to the plan thoroughly and on a consistent basis.

Embrace the Timeline!

Timelines communicate the state's dedication to seeing the plan through, shows that careful planning has been conducted, and helps hold those involved in implementation accountable. But remember that flexibility is crucial! Tasks, deadlines, and/or assignments will undoubtedly need to be adjusted along the way. The important thing is to communicate changes to your partners and stakeholders as they occur. Make sure they know what is happening, understand the ramifications, and are aware of how it may or may not directly affect them.

State Examples

Plan Maintenance

- The **State of Minnesota's** [Next Generation 9-1-1 Strategic Plan](#) documents its understanding of the importance of clear timelines that are based on standards development, legislative action, and funding:
"The transition timeline to NG9-1-1 must include all aspects of the vision as outlined in this document. As expected, timing is highly dependent on NG9-1-1 standards maturation, the legislative process, and the available resources including both people and budget. A baseline will be established founded on the results of investigations associated with developing this strategic plan. It is anticipated that the actual timeline will be a living, dynamic and evolving process that will be updated periodically as more and more is learned in execution of this plan."
- PEMA's [Statewide 9-1-1 Plan](#) for the **Commonwealth of Pennsylvania** states that their plan is a living document in the following manner:
"Serving as a charter for the future, this Strategic Plan must remain flexible as circumstances and technology change. It cannot be a static document. In establishing future milestones and an approach to successfully realizing those milestones, the Strategic Plan is not intended to be an operational or tactical plan."
- VITA maintains a number of documents related to the **Commonwealth of Virginia's** NG911 transition, including the [Statewide 9-1-1 Comprehensive Plan](#), which describes Virginia's envisioned future state and its overall strategy, and the [Next Generation 9-1-1 Deployment Plan](#), which is used as the tactical resource that identifies specific approaches and helps keep activities on track. This is the document that VITA revises on a routine basis in collaboration with agencies and stakeholders that play a role in implementation.
- TECB's [Strategic Plan](#) for the **State of Tennessee** highlights the importance of an update schedule in following manner:
"Annual review of its contents will ensure that the Strategic Plan remains relevant to the current operating environment. With a stable funding model and dedication to executing these best practices, the TECB will further advance its commitment to industry leadership in using technology to save more lives."
- To help keep the state focused and ensure successful outcomes, the **State of Illinois** calls for regular, scheduled times for plan review:
"...an annual review schedule that ensures all performance standards are evaluated for relevancy and modified as needed to remain aligned with national standards and best practices."
- UCA's [911 Strategic Plan](#) for the **State of Utah** is a 5-year plan; however, the state aims to review it on an annual basis because the environment is constantly changing.

CHAPTER 6: YOUR STATE PLAN'S NG911 Roadmap Section

Considerations & Best Practices

This section should serve as the motivational backbone of your state NG911 plan and can contain the following content:

- A detailed view of your state's current 911 environment (and which of the five NG911 transitional phases applies to your state);
- A detailed description of the future environment your state aims to achieve (think "next five years"); and
- Your state's vision, mission, and goals as it relates to achieving next-phase capabilities;

Highlight the Benefits of NG911!

Articulate how the state's future vision for NG911 will impact 911 service delivery. Point out the guiding principles that philosophically lead to the state's vision, and how those principles helped shape the state's goals, objectives and performance measures. NG911 is the most significant evolution of 911 service delivery that many 911 professionals will face in their entire careers. Explaining the benefits of NG911 and the consequences of not moving forward must be communicated to decision-makers, political bodies, funding organizations, responder agencies, and the public.

Current 911 Environment

Your overview of your state's current 911 environment should include the state's 911 coordination function, staffing, funding mechanism, institutional arrangements, authority, and other general aspects that govern or frame the environment. In this section of your state's plan, the environment should be described broadly since you will dive deeper into certain elements of the environment later in the plan.

Future 911 Environment—Vision, Mission, Goals, Objectives & Measures

As with your description of your state’s current environment, the overview of your state’s desired future environment should be brief since you will identify specific elements of the future environment later throughout the plan. This section can appear (in structure and tone) as a delineation of your state’s vision, mission, and goals. The goals can be supported by objectives and measures that narrow down specific activities and milestones. Accountability can be applied to objectives through the identification of success measures or metrics.

When developing your state’s NG911 vision, mission, and goals, it is important to realize the difference between the three elements (Figure 4 below).



Figure 4: Relationship and Differences Between Vision, Mission, and Goals Statements

- **Vision.** Your state’s vision statement should be limited to one or two sentences and identify the big-picture scenario or situation that will exist once your state achieves its future-state goals.
- **Mission.** Your state’s mission statement should describe your state’s role (and the role of the state 911 office) in achieving the vision and how it intends to apply its role in supporting jurisdictional efforts throughout the state.
- **Goals.** Your state’s goals represent high-level, general directions or milestones that must be explored or accomplished in support of the state’s vision. They should be broad, general intentions that are intangible and abstract. In essence, goal statements could address desired services and capabilities, the intent to obtain funding necessary for advancement, and other similar long-reaching, high-impact enablers of success.

As previously stated, objectives and measures are narrower, more task-oriented in nature, and should play a supportive role in service to the state’s NG911 goals. Objectives should be precise, tangible, concrete, and measurable. For example, objectives could address specific infrastructure, equipment, and technology that shall be acquired to meet a particular goal; or identify specific improvements that will be pursued in relation to enhancing operational support, staffing, or staff training.

Sustainable Funding

An approach to securing and maintaining sustainable funding is crucial to reinforcing that the vision for the states future NG911 environment is realistic and achievable. Decision-makers must have confidence that costs related to both technical and operational aspects of NG911 transition have been evaluated and can be addressed. Cost elements related to planning and procurement activities, data management responsibilities, technical applications and systems, infrastructure, security, and operational programs are among the areas that require consideration. More information about these categories and factors that are inherent to each are described in the FCC TFOPA report titled, [Working Group 3: Funding Sustainment Model](#).

Additionally, eligible uses of 911 funds and approaches for effectively managing funds are important components to describe. When doing so, references should be made to the statutes and regulations that provide specific parameters. Attention should be paid to whether such language protects the integrity of 911 funds. As advocated by NACo, state plans should discourage any use of 911 funds for expenditures that are not 911-related.

Know the System!

It is crucial also to understand the budget process and to know the staff that work with legislators on fiscal issues. Have a strong business case for the use of all of your state’s 911 funding and underscore your case by demonstrating the state system’s benefit to the public, first responders, and other 911 agencies.

Know the Numbers!

Make sure you are able to project the cost of implementing and maintaining an NG911 project. Take care to develop detailed estimates and budgets will save you from going back to the drawing board or having to find additional funding later in the game.

Know the Value!

Articulating how investments toward new NG911 capabilities can help drive out or minimize current costs is an effective way to obtain buy-in, facilitate approvals, and motivate collaboration.

State Examples

Current State Environment

- UCA's [911 Strategic Plan](#) for the **State of Utah** focuses more on the NG911 environment than the current environment. However, its section on the current environment is thorough and not only provides a general overview of 911 in the state of Utah, but also discusses its legislative environment, funding, 911 operations and staffing, and the current 911 technology and architecture.
- To depict its current state of NG911 readiness, the **State of Maryland** used the criteria developed by the FCC TFOPA, which are provided in the report titled, Federal Communications Commission (FCC) Task Force on Optimal Public Safety Answering Point Architecture (TFOPA) Working Group 2 Phase II Supplemental Report: [NG9-1-1 Readiness Scorecard](#), December 2, 2016. In its plan, Maryland uses a graphic to illustrate outcomes of the evaluation, helping to demonstrate where the state is and where the strategic plan needs to focus to advance NG911 implementation.

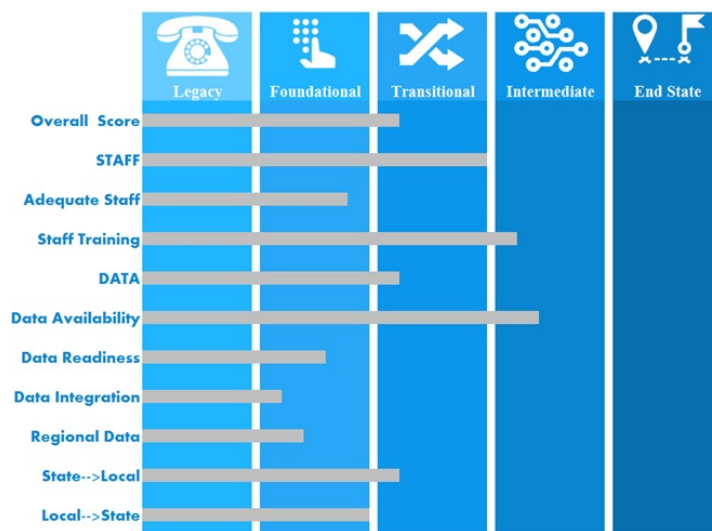


Figure 5: Graphic Depicting Maryland's Readiness Status

Future NG911 Environment: State Vision, Mission, Goals & Measures

- PEMA's [Statewide 9-1-1 Plan](#) for the **Commonwealth of Pennsylvania** lays out one-year goals complete with initiatives and estimated dates of completion. Strategic plan goals for years two and three also describe initiative completion timelines, and initiatives for years four and five build on accomplishments of previous years ensuring successful accomplishment of strategic goals.
- TECB's [Strategic Plan](#) for the **State of Tennessee** discusses the importance of stakeholder input in generating goals that then inform initiatives and priorities—all culminating in the strategic plan process:
"The Board and the State's 9-1-1 stakeholders have provided input into a strategic planning process, generating goals, initiatives, and priorities, all culminating in this TECB Strategic Plan. To remain successful, performance around these initiatives must be regularly measured. Performance measurement is the ongoing monitoring and reporting of program accomplishments, particularly progress towards pre-established goals. Performance measures usually speak to the process (how activities are conducted), outputs (the services or products delivered because of the initiative), and the outcomes (the results of the initiative or actions)."

State Examples (cont.)

Future NG911 Environment: State Vision, Mission, Goals & Measures (cont.)

- VITA's [Statewide 9-1-1 Comprehensive Plan](#) for the **Commonwealth of Virginia** illustrates their goals in a graphic that is easy to understand and immediately comprehend. It also illustrates goals that support the vision.



Figure 6: Virginia's Vision and Goals

- In the Statewide 911 Bureau's [Next Generation 9-1-1 Feasibility Study](#) for the **State of Illinois**, guiding principles that assisted in defining the primary driving forces of their strategy are clearly defined. By stating the guiding principles that drive the strategic vision, all stakeholders at every level are in an informed position of understanding the motivating forces that carry out the program, goals and objectives.

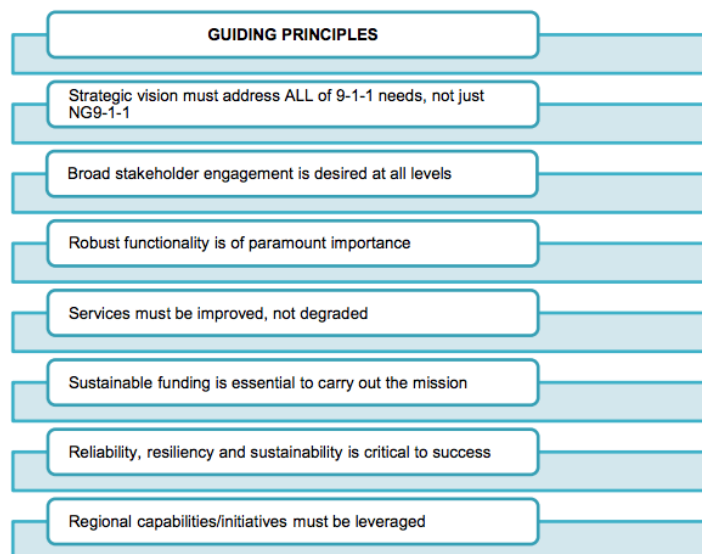


Figure 7: Graphic Depicting Illinois Guiding Principles

State Examples (cont.)

Future NG911 Environment: State Vision, Mission, Goals & Measures (cont.)

- The **State of Maryland** uses graphic representation to not only convey their vision, mission, and goals, but to depict how each build upon the other, creating a cohesive direction.



Figure 8: Graphic Depicting Maryland's Vision, Mission, and Goals

Using the graphic below, the **State of Maryland** tells the story of what the strategic plan can accomplish for the state in its progression toward NG911 implementation and suggests a path to achievement.

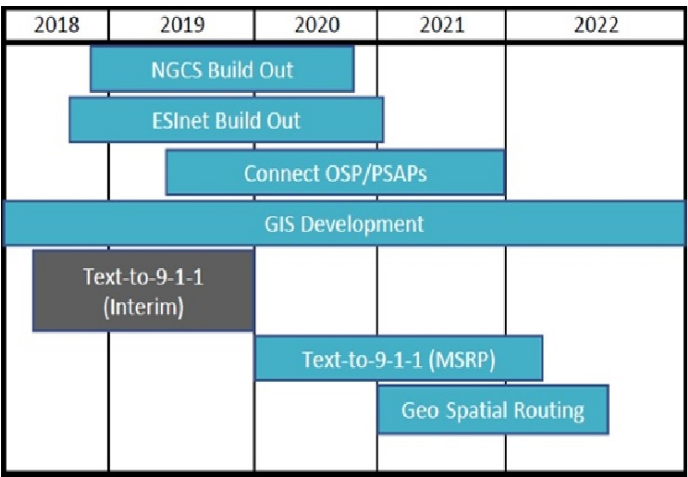


Figure 9: Graphic Depicting Maryland's Future State and Planned Progression

State Examples (cont.)

Sustainable Funding

- The **Commonwealth of Virginia’s** [Next Generation 9-1-1 Deployment Plan](#) describes several planned streams of funding, including the shift of the nature and model of its PSAP grant program, plans for seeking borrowing authority from the Virginia Treasury, and plans to maintain contingency funds.
- The **State of South Dakota’s** [State 9-1-1 Master Plan](#) describes the funding mechanisms and current revenues and costs of the state’s 911 system at the time of planning, then proceeds to identify NG911 funding considerations and the state’s detailed plan to address them through focused management and allocation of revenues generated by 911 surcharges.
- The **State of Nebraska’s** [Next Generation 911 Master Plan](#) dedicates an entire section to funding considerations. The plan first describes current funding as it relates to wireline, wireless, and 911-Support Allocation Methodology (911-SAM) funding. It then summarizes results of a survey that was conducted to identify funding challenges at the PSAP level. Based on survey results and an assessment of the state’s current environment, the plan goes into great detail on the approximate magnitude of annual cost projects for specific functionalities over a three-year period. Strategies for meeting funding needs include shifts in management of surcharge collection and potential changes to the current surcharge rate/formula.
- The **State of Indiana’s** [Statewide 9-1-1 Plan](#) dedicates an entire section of its plan to economics, describing its current funding structure and identifying that the structure may not be adequate to cover costs of NG911. It identifies available funding streams and how those will be allocated, then proceeds to list pending issues that are in need of further exploration. They punctuate that funding issues must be addressed at both policy and administrative levels:
“Effective public policy must recognize these realities and the statutory framework must assure adequate and sustainable funding to support the continued availability and quality of 9-1-1 throughout the state.”

CHAPTER 7: YOUR STATE PLAN'S Program & Operations Section

Considerations & Best Practices

This section might address the following elements of your state's 911 current and future environments:

- Governance and organization;
- Legislative process;
- Communications plans;
- Operational standards and best practices;
- General call processing and dispatch; and
- Professional development plans.

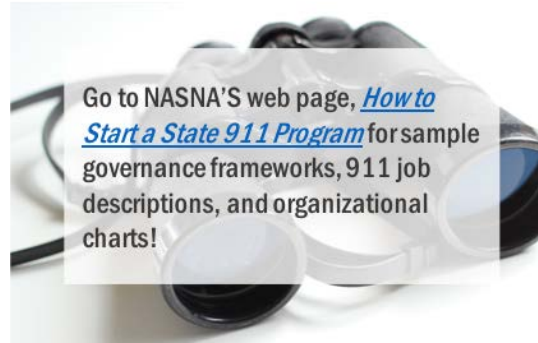
Within each of these topics, objectives toward moving from current to future state should be described, and the 911 stakeholder partners with which you will need to collaborate should be identified. There are many topics that can fit into this section. Below, are considerations for inclusion.

Coordination is Key!

The National 911 Program's *State Assessment Handbook: A Guide for States Participating in the Statewide 911 System Assessment Process* highlights the importance of statewide 911 coordination. Guideline GV2 calls for the authority and responsibility for statewide coordination as a fundamental role of state government. Coordination, however, is the end point. If two or three organizations are doing the same thing, there needs to be coordination. The focus should be on the function—one entity whose primary responsibility is to support and promote optimal 911 services. The coordinating entity could be a single coordinator, an agency, or a board/council with a primary responsibility to support and promote optimal and cost-effective 911 service. The entity provides governmental services to ensure the existence of 911 currently and into the future. There is a need for an entity that can coordinate the efforts of all appropriate agencies/entities that support the vision and mission for delivery of statewide 911 services. 911 is a complex system that necessitates leadership among the diverse and potentially competing stakeholder community.

Governance & Organization

- Description of any state-level 911 program or coordinating function, if such exists;
- How the function is organized or positioned within state government;
- Boundaries of the function's scope/authority;
- The function's mission statement;
- How the function is staffed;
- A description of its related institutional environment (e.g., other state agencies that may have a role in 911 affairs, such as the utilities commission);
- A description of the nature of its interactions or relationships with local or regional 911 authorities (e.g., how it exercises its coordinating function);
- Processes for interjurisdictional agreements;
- Its mechanism for allocating and distributing state and federal funding to PSAPs, if any;
- Its mechanism for coordinating the implementation of 911 system(s) and monitoring progress;
- Its current stakeholder engagement process and mechanisms for input;
- The current methods by which PSAPs integrate with emergency communications, telecommunications, and information networks;
- Procurement procedures and requirements;
- Operational budget and fund distribution policies; and
- Sustainable funding sources.



Clarify Roles and Responsibilities!

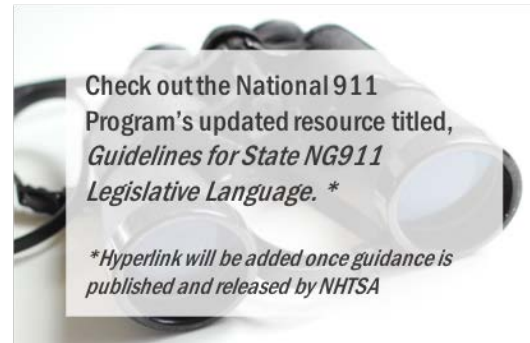
Be sure your governance, operations infrastructure and authority are clearly articulated in the plan. Everyone involved should understand who is responsible for the various aspects of NG911 such as operations, authority, management, funding, maintenance, and policy. Include, if appropriate, authority levels, coordination, and interactions at various levels (e.g., local or regional 911 authorities), and related agencies (e.g., procurement, Information Technology [IT] or GIS). Additionally, be sure to describe the nature of the state program's interactions or relationships with those various levels of governance.

Follow the Money!

To ensure that all parties understand fiscal responsibilities and anticipated contributions, describe sustainable funding sources, budgets and fund distribution policies, and procurement procedures and requirements.

Legislative Process

- Statutory provisions for 911 services, including governance, coordination, planning, and funding;
- Assessment of whether changes or updates to legislation or regulation are necessary or desirable to achieve the plan’s goals and objectives; and
- Pending legislation that may impact 911 service delivery, e.g., revisions to the state’s utility regulatory statutes.



The Importance of an Effective Legislative Framework!

The National 911 Program’s [*State Assessment Handbook: A Guide for States Participating in the Statewide 911 System Assessment Process*](#) acknowledges the statute and regulatory framework that contributes to an effective 911 system. Several of the guidelines focus on statute recommendations such as ensuring the statute allows for NG911, fosters an open and competitive procurement process, provides for interlocal cooperative agreements and relationships, and authorizes the coordination of 911 on a statewide basis.

Get Current, Get Aligned!

Conduct an assessment of existing legislation to determine if it contains outdated references or constrains the state’s ability achieve its goals and objectives. Currently, most current state statute related to 911 contains legacy language and references systems that are no longer (or soon will no longer be) operational. This outdated language is both limiting and incompatible with emerging technologies. Furthermore, such outdated text can often prohibit the use of funds collected for 911 purposes as systems progress. Consider all aspects of the NG911 system(s) from design, procurement, assigned authorities, standards, and guidance. If changes are desired or necessary, begin work on updates to legislation that will position the state to effectively and successfully carry out the state’s vision.

Communications Plan

- Stakeholder groups and their influence, investment, or interest in your state’s NG911 transition planning;
- Strategic communications, messaging, and stakeholder-specific value propositions; and
- Communications approaches, mechanisms, and timelines.

Messaging is Key!

Have a “sales pitch” and make sure that the vision can be communicated concisely and consistently. Work on getting your stakeholders to embrace and promulgate the vision—this is easier with a message that is both energizing and relevant to their own needs and missions.

746 **Operational Standards & Best Practices**

- 747 • 911 service standards;
- 748 • Staffing formulas/approaches;
- 749 • Standard operating procedures (SOPs);
- 750 • Roles and responsibilities;
- 751 • Processes for SOP changes and updates; and
- 752 • Performance measures and quality assurance approaches.

753 **State Call Delivery & Response Process Overview**

- 754 • PSAP operational models (e.g., shared services (centralized), hybrid, centralized call-taking
- 755 center, virtual);
- 756 • Call processing protocols, roles, and responsibilities;
- 757 • Call handling for new technology;
- 758 • Overflow routing plans;
- 759 • Reporting requirements;
- 760 • Roles and responsibilities; and
- 761 • Performance measures.

762 **Professional Development**

- 763 • Standards for training PSAP telecommunicators;
- 764 • Training standards for the communications training officer;
- 765 • Training standards for the public safety communications supervisor; and
- 766 • Training standards for NG911 technologies.

State Examples

Governance & Organization

- The Public Services Commission's (PSC) [Next Generation 911 Master Plan](#) for the **State of Nebraska** discusses governance and the need for a nimble structure that is resilient to the changes that NG911 presents:
"A well-crafted and functional governance and policy structure is imperative for ensured success in any facet of public safety. Evaluating, improving, and creating governance-focused documents simultaneously with the implementation and transition to new technology proves ideal, ensuring there are policies, guidelines, and rules in place from the initial implementation point. Governance plans include bylaws, committee structures, and policies that direct the governing group, in this case, the 911 Service System Advisory Committee in their decision making, their interaction with other members, their responsibilities as defined in statute, and their relationship with PSC, as the ultimate authoritative body. The plans also ensure staff and administrators are familiar with policies, procedures, and processes and eliminates recanting or revising after the implementation or transition period to create a more robust and effective governance framework."
Recent changes to Nebraska statute have positioned the state to proceed with their plan and prepare for NG911 implementation. The statute clarifies authority, updates technology references, outlines appropriate uses of funds for NG911 elements, and genericizes other technology terminology.

Legislative Process

- The **State of Michigan's** [State of Michigan State 911 Plan](#) acknowledges that:
"...changes in the state's 911 statutory and network environment need to occur. To that end, this Plan will be a dynamic document that is capable of reflecting those changes."
- As part of the Statewide 911 Bureau's [Next Generation 9-1-1 Feasibility Study](#) for the **State of Illinois**, completed in late 2017, an assessment of current statute was conducted. Existing text was evaluated against national trends and guidelines. Numerous updates and changes to existing legislative language were noted allowing the 911 authority to use the assessment to prepare proposed legislative updates.

Communications Plan

- The California Governor's Office of Emergency Services (CalOES) socializes and obtains buy-in for the **State of California's** [NG911 Transition/Implementation Plan](#) by conducting engagement sessions with localities and emphasizing that the state plan supports and is in service of the operational needs of jurisdictional 911 systems (as opposed to using a tone that conveys requirement or expectation of jurisdictions to align or comply with state plans). CalOES also recognizes that keeping things simple and consistent is essential for ensuring universal understanding of California's vision. They use a roadshow presentation that is while visiting jurisdictions and is always available on their website in both [slideshow](#) and [video](#) formats.
- PEMA's [Statewide 9-1-1 Plan](#) for the **Commonwealth of Pennsylvania** articulates that in order to effectively and successfully carry out their plan, they realize that engaging the public safety communications community and educating them on the Plan's goals will be critically important. Their communications strategy for this effort is two-fold. First, the strategic vision is developed with input from key stakeholders, and then communicated to local public safety practitioners, educating them about their contributory role as it relates to achieving the vision. Second, a public education component of the communications strategy provides the general public with information on the Commonwealth's plans to improve their emergency communications system.

State Examples (cont.)

Communications Plan (cont.)

- TECB's [Strategic Plan](#) for the **State of Tennessee** demonstrates understanding of the importance of communication. As just one example, the plan calls for creating a communication and education strategy to aid in adoption of the hosted call-handling solution described in their plan. They note a comprehensive approach that should focus on the capabilities the solution will provide and highlight the forward-looking interoperability functions and cost efficiencies. Ultimately, this method will play a significant role in improving the likelihood of widespread acceptance. Plans also include proactive outreach activities, a comprehensive social media campaign, and plans for web-hosted presentations and regional roadshows to explain the solution benefits and its role in the overall vision of NG911 in the state.



Figure 10: Graphic Depicting Communication as One of TECB's Strategic Focus Areas

- For the **Commonwealth of Virginia**, VITA's routine communication with their Regional Advisory Council (RAC) is an essential component of communicating goals set forth in the Commonwealth's [Statewide 9-1-1 Comprehensive Plan](#) and the tracking of NG911 needs and activities relevant to its [Next Generation 9-1-1 Deployment Plan](#). While undergoing its NG911 feasibility study in 2015, local public safety communications officials expressed their desire to have a greater voice, representation, and input into the work plan and program of Virginia's 911 Services Board. To address this need, VITA formed the RAC which offers the local PSAP community and other stakeholders a bi-monthly forum to discuss statewide issues and bring concerns or ideas for improvement to the Board. The RAC is also intended to be the conduit for the needs and requirements of each of the seven regions of the Commonwealth and plays a significant role in increasing awareness and supporting outreach efforts regarding Virginia's 911 ecosystem and future directions.
- The **State of Michigan** uses its reporting mechanisms to help communicate progress toward achieving goals outlined in the [State of Michigan State 911 Plan](#). Progress and successes are detailed in the State 911 Administrator's quarterly reports to the State 911 Committee. Such consistent reporting helps to keep progress moving and provides communication points that interest and engage the 911 community. This approach also helps establish a shared sense of achievement.
- The Statewide 911 Bureau's [Next Generation 9-1-1 Feasibility Study](#) for the **State of Illinois** calls for engagement in routine briefings to keep communications flowing and garner on-going support:
"Develop a series of "NG9-1-1 Informational Briefings" for PSAP leadership to: increase understanding of planning processes; make available tools and resources for migrating legacy equipment to NG9-1-1 technology; and develop progress status reports on statewide implementation."

State Examples (cont.)

Operational Standards & Best Practices

- UCA's [911 Strategic Plan](#) for the **State of Utah** has a large section on minimum standards and best practices. It uses national standards that APCO, NENA, and the National Fire Protection Association (NFPA) have established. These standards relate not only to training, but for every technical and operational aspect of a PSAP. Every PSAP in Utah has agreed to make transitions necessary to adhere to these standards over the next few years. Ubiquitous adoption across Utah is collectively considered a priority for ensuring that every 911 caller receives the same level of service regardless of where in the state they are located.

Per Utah's legislative mandate, [Code 63H-7a-302](#), the 911 Division will develop minimum standards and best practices for PSAPs. The minimum standards and best practices will include minimum technical, administrative, fiscal, network and operational standards for PSAPs. These standards address such critical items as minimum staffing, emergency medical dispatch, call prioritization, quality assurance programs, and minimum training requirements. The requirements also call for annual reports from PSAPs to ensure compliance.
- In the **State of South Dakota**, responsibilities for developing criteria and standards for PSAPs (along with conducting performance audits and evaluations and setting minimum standards for operating and financing PSAPs) is assigned to the South Dakota 911 Coordination Board. [Chapter 50:02:04](#) of the South Dakota Administrative Rules outline the minimum standards for operating and financing a PSAP in South Dakota. The chapter is maintained by the 911 Coordination Board (administratively through the Department of Public Safety). The South Dakota program anticipates administrative rules of this chapter will soon require revision due to requirements of the new State NG911 System.
- The **State of Minnesota's** SECB approved technical and operational standards to ensure interoperability of technology and operations across the state. The SECB implement Text-to-911 statewide using regional PSAPs. An operational standard for 911 telecommunicators was developed to ensure that texts are transferred and handled the exact same way across the state. This standard also provides a script for consistent messaging across the state on how text is deployed and the expectations of a PSAP as it prepares to take 911 texts.
- TECB's [Strategic Plan](#) for the **State of Tennessee** addresses a number of standards such as those for the NENA i3 Solution, location routing function, location validation function, and policy routing rules (in addition to training standards).
- The Statewide 911 Bureau's [Next Generation 9-1-1 Feasibility Study](#) for the **State of Illinois** clearly highlights that effective NG911 systems will rely on standards by pointing out:

"...that to accomplish the vision of NG9-1-1 in Illinois, which includes both the ESInet and NGCS [Next Generation Core Services], standards-based system solutions are required. The use of a standards-based NENA i3 architecture will ensure that vendor-agnostic solutions are deployed to meet the needs of the system, thus allowing for flexibility in procurement options when considering both the ESInet and NGCS."

Additionally, Illinois statute and operational rules, which became effective in May, 2016, allows PSAPs until May 2018 to achieve compliance to requirements including that which mandates that all Illinois PSAPs must SOPs that ensure telecommunicators prioritize emergency functions over non-emergency functions.
- PEMA's [Statewide 9-1-1 Plan](#) for the **Commonwealth of Pennsylvania** outlines the importance of relying on NG911 technical and operational standards related to network design, security, backup procedures, information sharing, and call transfers to highlight just a few. To achieve their strategic objectives, PEMA has identified required subcomponents so that each objective of their plan can be integrated into the larger whole. These objectives, they note, require strong, overarching governance, security, and standards that are jointly adopted and implemented. All must be committed to uniform standards in technology and operations for NG911 to be truly as effective as it can be.

State Examples (cont.)

Operational Standards & Best Practices (cont.)

- The **State of Maryland**'s plan acknowledges that standards will need to be developed for both technical and operational components of NG911. Their position is that development and adoption of standards will be essential to ensure the interoperability of 911 systems across Maryland, and to keep counties in alignment with the state's vision and strategic plan. Not only will standards be crucial pertaining to data transfer between callers and PSAPs, but standards also will be important for the seamless transfer of data from the PSAP to first responders. Standards can be developed around how to deploy and handle text-to-911 service and how to store additional data (e.g., pictures, video) when these capabilities are available in the future.
- **State of Nebraska** statute identifies the need for a Quality Assurance (QA) position in their NG911 program and assigns responsibility to the director. Codification in law can be no greater message to the importance of the process of QA and the essential links between a QA program and successful outcomes.
- The **State of Michigan** engages their PSAP stakeholder community in the development of a "set of operational standards and model policies for PSAP operations, 911 fund use, service provider 911 delivery functions, and best practices for 911 governing authorities." They establish a timeline for completion and performance measures to demonstrate successful completion of goals.

State Call Delivery & Response Process

- The **State of Maryland** and the **Commonwealth of Pennsylvania** require third-party protocols such as for emergency medical dispatch (EMD). Most states rely on protocols developed in a standardized method to ensure compliance with nationally-developed standards. This reliance on nationally recognized and accepted protocols helps PSAP training, the efficient use of resources, and the consistent provision of service to citizens and support to responder agencies.
- The **State of Michigan**'s [*State of Michigan State 911 Plan*](#) identifies the critical role that operations, staff, and training plays in the migration to NG911.
"It is critical that PSAP Administrators remain current on evolving multimedia technology and standards throughout the transition to NG911 and adjust operational procedures and policies, staffing levels, and training programs accordingly."
- The **State of Vermont**'s Enhanced 911 Board is one of the first to implement a next generation statewide 911 system that delivers 911 requests from the Public Switched Telephone Network (PSTN) to a PSAP using VoIP over its ESINet. Currently, the Vermont's 911 System consists of six diverse locations collectively serving as one statewide 911 system. 911 requests are initially routed to one of these answering points based on the originating caller's location.
Additionally, Vermont has [policy on outage notifications](#) requiring all telecommunications companies operating in Vermont to report service disruptions affecting access to 911.
- In addition to a COOP, the **State of Minnesota** requires each county to provide backup process description, as well as overflow and other disaster recovery elements. In this way, the state has a full view and statewide picture of operations under extenuating circumstances allowing it to plan support where needed.
- TECB's [Strategic Plan](#) for the **State of Tennessee** establishes best practices for conducting regularly scheduled reviews of existing alternate routing plans (e.g., annual audits). These include review of each PSAP's Overflow, Disaster, and Maintenance plans. The reviews occur after major provisioning changes are made, in addition to regularly scheduled audits.

State Examples (cont.)

State Call Delivery & Response Process (cont.)

- The **State of Minnesota** publishes a [*Dispatchers Communication Best Practices Guide*](#)—a result of a collaborative effort among the Operations and Technical Committee, Interoperability Committee, the NG911 Committee, and the Dispatch Best Practices Workgroup (and approved by the Statewide Emergency Communications Board). The guide provides operational best practices for the 911 telecommunicator on how to best use the NG911 system, such as how to transfer texts to 911, the state's radio system, console operation, interoperability, incident management, communications response, and incident dispatch, and provides guidance on a refresher training plan. The state also produces best practices guides in emergency management, law enforcement, fire service, public alerting systems, and public works communications.

Professional Development

- PEMA's [*Statewide 9-1-1 Plan*](#) for the **Commonwealth of Pennsylvania** calls for minimum training and/or certification as a focus in their one-year goals. Their desire to develop a centralized repository of training and educational resources available to help individual PSAPs and regions to achieve minimum training standard requirements is a testament to their mission and vision for professional development in their state.
- Training standards set the tone and structure for professional development as outlined in the [*Strategic Plan*](#) for the **State of Tennessee**:
"...the establishment of minimum training requirements to provide for a baseline, ubiquitous end-user experience across the state. With minimum training requirements, the State can establish a professional 9-1-1 telecommunicator certification-an important element of a professional development program."
Additionally, TECB is helping their Emergency Communications Districts (ECDs) create a tool that identifies pathways to career advancement. Identifying professional milestones and pathways to advancement helps 911 telecommunicators know the requirements and steps to take to be eligible for management and executive leadership roles in their districts and within the state. The TECB internal statewide survey results surfaced desires for the trainings described in the following statement.
"Per requests from stakeholders statewide, at a minimum, the Board should provide training in the following areas: dispatch, management, and instruction on finance and budgeting. In addition to these requests, other national topics that may be useful for telecommunicators in Tennessee include: NG9-1-1, GIS, and cybersecurity."
- The **State of Nebraska** seeks to leverage existing training that is based on national standards and best practices to accelerate the timeline for delivering training to telecommunicators. Training can be customized to the specific needs of the State. It should be noted; however, that this approach can take longer, and challenges exist for reciprocity and mutual aid with border agencies. To mitigate the challenges of custom/one-off training programs, numerous training sources exist that can be leveraged to develop standardized training for telecommunicators, supervisors, training officers, and managers.
- The **Commonwealth of Virginia's** PSAP Education Program provides funding to primary PSAPs for the purpose of obtaining 911 and GIS education and training. PSAPs can either apply a \$3,000 allotment per primary PSAP for single jurisdiction requests, or \$4,000 allotment per primary PSAP for multi-jurisdictional requests. PSAPs are able to use funds to attend online or in-person training, attend conferences, or apply funds to certifications administered by the Commonwealth's Department of Criminal Justice.

CHAPTER 8: YOUR STATE PLAN'S Technical Systems Section

Considerations & Best Practices

This section should address the following elements that may be applicable to your state's 911 current and future environments:

- NG911 open standards-based & compliant ESInet & core services
- Call handling equipment (CHE);
- Computer-aided dispatch (CAD);
- Mapping system/geospatial routing;
- Voice/data logging recording;
- Radio systems;
- Citizen notification systems;
- Mobile broadband networks;
- Clock synchronization; and
- Security.

This is a Tricky Section!

While your state 911 office may not have authority over procurement, maintenance or operations for many of the areas listed in this section, it is important for you to know which aspects of such areas affect or intersect with 911 functions for which you are responsible. For example, while the overall radio system infrastructure may be under another agency's purview, you may have certain responsibilities or protocols for radio consoles used for 911 services. It is important for you to be aware of these distinctions and to address relevant intersections in your state plan.

Within each of these topics (as appropriate), objectives toward moving from current to future state should be described and the 911 stakeholder partners with which you will need to collaborate should be identified.

NG911 Open Standards-based & Compliant ESInet & Core Services

- End-to-end IP connectivity;
- Existence/use of gateways to accommodate legacy wireline and wireless origination networks that are non-IP;
- Existence of an NG911-compliant ESInet; and
- Capabilities of PSAPs to receive IP-based signaling and media for delivery of emergency calls.

Call Handling Equipment

- Legacy call handling system and decommissioning parameters;
- IP-based call handling system;
- Multimedia call handling system; and
- Interim SMS Text-to-911.

When Your System Leaves Its Legacy!

Plan the retirement and decommissioning of existing legacy technology such as selective routers. Identify the process to be followed, fallback options and plans, timelines, responsibility assignments, and testing efforts that will be conducted once new technology is functional. Technically, keep in mind that one of the most complex areas of transition at this point may involve how OSPs delivery traffic into the network. Additionally, the state will need to determine if changes to the network from the legacy technology to NG911 technology will cause any issues with the existing logging and recording devices in use today. An assessment of current systems will help determination if they are compatible with new IPE-Customer Premise Equipment (CPE) or CAD systems or if software or hardware changes or upgrades are unnecessary. Integration costs, if any are determined to be needed, will need to be budgeted and planned for.

Multimedia Call Handling Systems are NOT “The Future” –They’re “The NOW”!

Multimedia functions might include such things as conference bridge resources or logging recording services for all forms of media (e.g., voice, video, text). Technology providers, such as RapidSOS with their NG911 Clearinghouse and Rave Mobile Safety with their Smart911 application, have solutions to deliver additional data through NG911-compliant interfaces. These technology providers also are breaking down barriers to entry by partnering with equipment manufacturers to provide integrated user interfaces for the Additional Data Repository (ADR) technologies with call-handling, CAD, mapping and other systems. Additional data is housed in several sources and provided by a device/user agent, ADR/Identity Searchable(IS)-ADR, LIS. Leveraging available assets for Additional Data promises to provide fundamental improvements in the quantity and types of data available to telecommunicators to improve efficiencies and effectiveness of emergency response.

Text Messaging and 911!

Text-to-9-1-1 provides direct and equal access to all users and has become an expectation from the public. While not directly an NG911 feature, the interim SMS text-to-911 solutions are frequently considered a part of migration to NG911. Technically this is not accurate, but because the technology reflects new ways of processing 911 calls (and current technology to send and receive 911 related requests for service), state NG911 strategic plans often include implementation of the service. Be sure to clarify that interim SMS text-to-911 can occur without transition to NG911 technology, but the implementation of text entails the same burdens as NG911 such as funding, planning, operational policy, and changes to protocol, training and staffing issues.

1023 Computer-aided Dispatch (CAD)

- 1024 • CAD equipment and capabilities.

1025 No CAD? No NG911!

1026 CAD systems with their software modules, incident data, connectivity to records management systems, and data logging
1027 devices are one of the most significant tools in the PSAP toolkit. Plan for its evolution along with other technology
1028 upgrades to the PSAP in the transition to NG911. PSAP personnel and dispatchers are reliant on these systems and
1029 downtime cannot be tolerated. Ensure that communication with CAD providers is part of your planning process.
1030 Additionally, one of the benefits and promises of a robust, interconnected IP network and statewide call delivery systems
1031 is the allowance for alternate routing parameters, permitted shared systems, such as CAD, to facilitate improved
1032 resiliency.

1033 Mapping System/Geospatial Routing

- 1034 • Systems that support capabilities to display caller location information at PSAP 911 call
1035 handling positions (Location Information Server [LIS]).

1036 The GIST of GIS!

1037 By requiring GIS data stewards and vendors to meet NG911 requirements, the state will be in a better position to ensure
1038 that its GIS data is used for call routing and that call processing is accurate, integrated, and timely.

1039 Voice/Data Logging Recording

- 1040 • Systems that support local PSAP functions for logging and recording voice and data calls.

1041 Log Your Logging Systems!

1042 Systems that support local PSAP functions for logging and recording voice and data calls should be identified in a
1043 statewide plan, document, or report. States that require the logging and recording of 911 calls, either by statute, policy,
1044 or regulation, should consider that a section of their 911 plan describe how this requirement is addressed throughout
1045 the state. If a county or regional plan is also required to be submitted to the state, this may be an ideal method to collect
1046 the information on voice/data logging systems statewide. Painting a statewide picture of the systems used in the
1047 processing of 911 calls helps to link the various systems (and their associated resource allocation) for policy and funding
1048 decision makers.

1050 Radio Systems

- 1051 • Radio systems used for dispatch of first responder/public safety resources.

Citizen Notification Systems

- Alerts and warnings systems for notifying the public of impending or occurring emergency situations.

Take Notice of Notifications!

Systems that support local PSAP functions for logging and recording voice and data calls should be identified in a statewide plan, document, or report. States that require the logging and recording of 911 calls, either by statute, policy, or regulation, should consider that a section of their 911 plan describe how this requirement is addressed throughout the state. If a county or regional plan is also required to be submitted to the state, this may be an ideal method to collect the information on voice/data logging systems statewide. Painting a statewide picture of the systems used in the processing of 911 calls helps to link the various systems (and their associated resource allocation) for policy and funding decision makers.

Mobile Broadband Networks

- Broadband networks and applications that are in use by responders and their potential operational impacts on PSAPs.

Think Broadly About Broadband!

Be aware that there are a variety of broadband networks that may be available to the first responder community. These include satellite, municipal WIFI, commercially-available broadband, and FirstNet. Consider connecting with your state point of contact (SPOC) for FirstNet and your statewide interoperability coordinator (SWIC) to engage them in your planning process. Understanding the environment and being aware of the applications responders are using will help you identify and discuss any issues regarding expectations of PSAP personnel, the influx of data, and workflows that may be affected.

Clock Synchronization

- Systems used to ensure time synchronization across all technical systems involved in call handling through dispatch and logging.

You Can Control Time!

Synchronizing internal clocks to a master time device helps ensure consistency of time stamps added to event records, reports and voice recordings, and equipment (e.g., CAD, automatic number identification (ANI)/automatic location identifier (ALI) controllers, logging recorders, radio consoles). The benefit of doing this is not only consistency in time records of an event, but also the reliability of these devices to assist with recreation of an event for investigative purposes or legal support. NENA's standard, *NENA-STA-026.5-2016 (originally NENA 04-002), ANS approval date 12/21/2016* provides guidance for designers and manufacturers of PSAP equipment for use in this environment. However, note that NENA reports that their specifications are not for use for NG911 time synchronization—those specifications can be found in the Time Server section of *NENA-STA-010.2-2016 (originally 08-003)*. It is expected that as equipment supports NG911, use of NENA-STA-026.5-2 will decline.

1086 Clock Synchronization (cont.)

1087 Your Time is Precious!

1088 A dedicated network time server protects you from the security risks inherent in obtaining or using only Internet time. By
1089 installing a time server within your firewall, risks from the outside are minimized and the timing accuracy on your network
1090 is maximized. Systems used to ensure time synchronization across all technical systems involved in call handling through
1091 dispatch and logging can save time in the long run.

1092 Check Time and Time Again!

1093 Once systems have been converted to NG911 platforms and technologies, a resynchronization of all devices and related
1094 systems should be conducted to ensure that all continue in sync as expected. Written reports should document the testing
1095 and be archived in keeping with historical record keeping and documentation best practices.

1096 Security

- 1097 • Systems to ensure physical and cybersecurity of all technical systems involved in 911 service
1098 delivery—identification and discovery, assessment and prioritization, remediation
1099 implementation and operations, and monitoring and analysis; and
- 1100 • Alarm codes and alarm management.

1101 Safety First!

1102 The U.S. Department of Homeland Security Office of Emergency Communications
1103 (OEC) has identified Cyber Security as an important area of concern as NG911 systems are deployed throughout the U.S.
1104 The potential cyber risks to a NG911 system do not undermine its tremendous benefits; however, cyber risks do present
1105 a new level of exposure that states and PSAPs must understand and actively manage as a part of a comprehensive risk
1106 management program. Past events have proved 911 systems are attractive targets for cyber-attacks. For example,
1107 attackers have disrupted the availability of traditional 911 systems with Telephone Denial of Service (TDoS) attacks that
1108 use auto-dialers, computer dialing devices, or programs to overwhelm PSAP phone lines and cause congestion or
1109 overload. Location-based records and databases that support NG911 are of interest to cyber criminals, data miners, and
1110 even nation-states wanting to access and exploit that information.

1111 An established ESInet, although isolated from commercial or public use, is still vulnerable to the threat of a security
1112 breach at any network ingress or egress point. A state-wide security policy should be developed based on nationally-
1113 accepted standards and best practices established by organizations such as NENA and the National Institute of
1114 Standards and Technology (NIST). The design of intrusion-protection components should be based on nationally-
1115 accepted cybersecurity framework standards, such as [*NIST's Framework for Improving Critical Infrastructure*](#)
1116 [*Cybersecurity*](#).
1117

State Examples

NG911 Open Standards-based, Compliant ESInet & Core Network Services

- Numerous sections of the TECB's [Strategic Plan](#) for the **State of Tennessee** address the need to be compliant with the NENA i3 Solution foundational elements. They have integrated i3 compliance with goals related to GIS, call handling equipment, location validation functions and location information servers, policy routing, interfaces, and additional data integration.
- PSC's [Next Generation 911 Master Plan](#) for the **State of Nebraska** identifies that it is the intent of the state to:
"...through the governance structure, adopt standards for the networks, call handling systems, and i3 next generation core systems."
This commitment to build their NG911 on the NENA i3 solution follows their approach to best practices implementation throughout all aspects of their initiatives.
- The **State of Minnesota's** [Next Generation 9-1-1 Strategic Plan](#) also commits to following NENA i3 recommendations and specifications. They list the current standards that are applicable and note that given the early stages of standards development and ongoing technological iterations, standards will likely experience changes over time. To address this reality, the state commits to:
"...include a 'Due Diligence' process to strengthen requirements definition prior to entering the procurement process. The intent of the due diligence process is to meet with potential service providers of i3 features and functions to learn about the respective service offerings and educate the potential service provider about Minnesota's needs."
- The **Commonwealth of Virginia**, in order to achieve their vision to establish a strategy for funding the statewide deployment of NG911, defines their initiative to:
"Create NG9-1-1 deployment and sustainment funding strategy that aligns with the statewide 9-1-1 funding strategy, taking into consideration potential technology such as text-to-9-1-1, implementation of an i3-capable Emergency Services Internet Protocol (IP) network (ESInet), regional NG9-1-1 pilots, and GIS database development."
- Many of the statewide plans consulted for this guidance (e.g., **Nebraska, Michigan, Minnesota, Virginia**) refer to the NENA i3 Solution and the goal of end-to-end IP connectivity. They note it is an iterative process and many indicate to their policy makers that a phased approach may be the most prudent path for the state.
- The **State of Michigan**, to highlight just one example, acknowledges that not all PSAPs/counties/regions will migrate at the same time. The legacy network and selective routers supporting the circuit switched network must continue to function. To ensure this happens in the most expeditious manner, its [State 911 Plan](#) envisions that:
"...legacy system would eventually connect to an ESInet gateway and convert legacy wireline/wireless 911 calls from analog into Session Initiation Protocol (SIP), attaching the caller's location information and presenting the call to the ESInet."
- The backbone of any NG911 system—the ESInet—provides interconnectivity between one or more networks, while supplying a high level of service and redundancy to public safety operations. One of the many benefits of an ESInet is the ability for PSAPs to share infrastructure and, in some instances, consolidate back-end technology services. State NG911 plans, such as PEMA's [Statewide 9-1-1 Plan](#) for the **Commonwealth of Pennsylvania** should specifically state their commitment to ensure that this statewide interconnectivity is accomplished in a coordinated, standardized, and timely fashion.

State Examples (cont.)

Call Handling Equipment

- UCA's [911 Strategic Plan](#) for the **State of Utah** and the **State of Minnesota's** [Next Generation 9-1-1 Strategic Plan](#) discuss the transitioning process from legacy technology (such as selective routers) to i3-compliant NG911 ESInet technology and lay out plans and strategies for that process including decommissioning parameters.
- With the goal of equalizing and decreasing the cost of end user CPE for PSAPs, the UCA reports that the **State of Utah** will leverage its position as a statewide agency by negotiating statewide contracts for i3-compliant, NG911 system equipment and services. One of the benefits of this plan will be the leveling of expenses coupled with more certainty regarding future expenses.
- PSC's [Next Generation 911 Master Plan](#) for the **State of Nebraska** notes that as there are no current fully-matured NG911 networks in place enabling the transmission of data from callers to PSAPs more than text messaging, the exact configurations of the demarcation points and technical specifications are not yet known. What also is unknown are the interface specifications between the networks and applications such as CAD. For this reason, Nebraska cautions that it is important for the persons responsible for the deployment of each network to maintain regular communications with each other, so these interfaces and interconnections can be developed to work in both directions.
- The **State of Minnesota** designed a regional approach to text-to-911 implementation that allowed them to deploy text services on a statewide basis in about a quarter of the time an 87 county-by-county implementation might have taken. By selecting seven regional dispatch centers to accept calls for their entire region until individual PSAPs could prepare, train, install the appropriate equipment, etc., the state was able to provide equal service to all users at effectively the same time.
- The CPE is the call-handling telephone equipment at the PSAP. Existing legacy phone systems and networks cannot be interconnected, are not redundant, and will not allow critical 911 information, such as automatic number identification/automatic location identification (ANI/ALI) information, to be passed from one PSAP to another. With IP call handling systems that are a part of NG911, caller-related data is automatically and electronically shared, reducing the call-processing time and risk of making a transcribing error during a 911 call-taker hand-off. Today, some regions in the **Commonwealth of Pennsylvania** leverage regional PSAP interconnectivity to deploy a shared approach that saves money, both in terms of capital expenditures and monthly maintenance fees. For both CAD and CPE sharing, PEMA states that the Commonwealth:
"...is committed to supporting these initiatives and making them a high priority for funding."

CAD

- As PSAP core services migrate from legacy to NG911-ready technology, the ESInet needs to be capable of supporting projected IP traffic associated with real-time data and media streams. Additional applications and services that would use the ESInet include CAD systems, CPE, data loggers, and management information systems (MIS). A fully compliant NG911 architecture must have the ability to support NGCS and provide transport for other 911 applications. PEMA's [Statewide 9-1-1 Plan](#) for the **Commonwealth of Pennsylvania** articulates that vision and the plan initiatives provide a path to desired outcomes.
- The **State of Tennessee** is exploring the potential of offering a hosted call-handling solution to lay a foundation for enhanced interoperability across the state. PSAPs using such a platform could achieve true interoperability with the implementation of a hosted/shared CAD system or through the implementation of a CAD-to-CAD solution. When combined with the future capabilities promised by [FirstNet](#), the combination of technologies will enable significant advancement in resolving the long-standing operational limitations of alternate routing calls to neighboring jurisdictions.

State Examples (cont.)

CAD (cont.)

- The **State of Minnesota's** [Next Generation 9-1-1 Strategic Plan](#) addresses the important function that CAD plays to support 911 call processing in the PSAP. The plan notes that:
"Services such as CAD and logging must interface with new functions and handle new data sources and/or formats. Definition has not progressed to a point that these requirements can be articulated; however, they are included here to facilitate further discussion and inclusion in implementation plans at the appropriate time."

Mapping System/Geospatial Routing

- GIS data is one of the foundational elements for NENA i3 call-routing solutions and NG911. TECB's [Strategic Plan](#) for the **State of Tennessee** provides a model for other states in outlining consistent and cohesive GIS data management processes. The plan encourages the integration of NENA's civic location data exchange format (CLDXF) standards to Spatial Interface (SI) functions. Tennessee believed that compliance with these standards will facilitate interstate communications with neighboring NG911 solutions as they are deployed. Furthermore, this integration will aid in the implementation of additional NG911 services that rely on spatial data moving forward.
- VITA's VGIN Geospatial Services [GIS Strategic Plan 2015-2020](#) demonstrates the prioritization and integration between GIS and 911 for the **Commonwealth of Virginia**. The goals underline the importance and benefits of developing standards and support from the Regional Outreach Program to encourage local governments to develop GIS datasets with an eye to creating and maintaining multi-purpose GIS datasets in lieu of GIS datasets that are dedicated for public safety use. VGIN also established the web page, Virginia Geospatial Data Standards, which is housed within Virginia's GIS Clearinghouse. Using the framework of VITA's Information Technology Resource Management policy, geospatial standards that can be accessed at the page can be maintained in an enterprise context and draw heavily on the content of NENA's Next Generation 911 Data Model Workgroup. Virginia, along with other states, are in the process of determining the process of aligning existing state-based standards to be compatible with this content.
- The **State of South Dakota's** [State 9-1-1 Master Plan](#) requires the aggregation and maintenance of their statewide GIS dataset to provide for near real-time updates of geospatial data. This requirement is expected to facilitate the following:
 - Update receipt and integration of geospatial data from each 911 entity's GIS;
 - Perform quality assurance on the data to meet accuracy standards;
 - Facilitate and coordinate resolution of conflicting geospatial datasets;
 - Execute timely export of the geospatial data on a permission basis; and
 - Assure dynamic (real-time) changes to routing geospatial data, and its export.

State Examples (cont.)

Radio Systems

- In some cases, statewide programs that manage and coordinate 911 also are involved in other aspects of public safety communications such as radio systems, alerting systems, etc. In these instances, the 911 plans may also be incorporated into a department-level master plan that encompasses all aspects under the authority of the agency. In the **State of Minnesota**, the ECN Division within the Department of Public Safety has responsibility to carry out the SECB's [2016 – 2018 Strategic Plan](#) which embraces a holistic approach to communication methods used by first responders. The ECN Division oversees the Statewide 911 Program, Allied Radio Matrix for Emergency Response (ARMER) radio communications network, the Interoperability Program, Integrated Public Alert and Warning Systems (IPAWS), and a statewide Wireless Broadband initiative in coordination with [FirstNet](#). This coordinated governance helps integrate various aspects of emergency communications services in a more effective and efficient way than if all the services were uncoordinated or separately managed.
- The **State of Utah** is another example of integrated program and services. In 1997, the Utah Communications Agency Network (UCAN) was created as an independent agency to provide statewide, two-way, public safety radio coverage for first responders throughout Utah. UCAN's initial focus was to develop an 800 MHz radio system to cover the Wasatch Front region for the 2002 Winter Olympics. Over the years, the system has expanded to provide coverage throughout much of Utah and now supports almost 30,000 mobile and portable radios. In the 2014, Utah consolidated UCAN with the Utah 911 Committee, which was established in approximately 2004 to drive the implementation of Phase II 911 services and renamed the combined organization UCA. With this consolidation, UCA was also given the responsibility to provide administrative and financial support for 911 emergency services on a statewide basis.

Citizen Notification Systems

- A **State of Minnesota** strategy to promote statewide deployment and adoption of the Integrated Public Alert and Warning System (IPAWS) to facilitate communication to the public when the need arises is part of their strategic plan initiatives. This alerting system uses locally issued Wireless Emergency Alerts (WEA) and Emergency Alert System (EAS) messaging in situations requiring those in harm's way to take protective action, such as an active shooter scenario, train derailment, or nuclear power plant incident. In order to ensure that the public and all stakeholders understand public safety communications and its critical role in all aspects of public safety, the Emergency Communications Division of the state of Minnesota Department of Public Safety has established a strategy to provide training opportunities. They have partnered with a local Technical College to review, update, and expand IPAWS Public Alerting Authority Best Practices along with supplemental material demonstrating testing on various Mass Notification systems.

State Examples (cont.)

Security

- [DHS OEC](#) encourages PSAPs to adopt a security first perspective, stating:
"...cybersecurity has become an integral part of mission function and operations for NG911 systems. Working with others within the NG911 community, government, industry, and academia to establish consistent standards, policies, procedures, interoperability and implementation guidance for NG911 deployments is crucial."
- UCA, following the guidelines of OEC, documents their agreement that cybersecurity is an essential element in the implementation of the statewide NG911 system and includes initiatives in the **State of Utah's [911 Strategic Plan](#)** for. The plan includes initiatives related to cybersecurity assessments, COOP planning following [FEMA's model](#), and other disaster preparedness and recovery efforts are to be documented by PSAPs and submitted to the state.
- The **State of Michigan** pays close attention to the importance of cybersecurity protections and programs. In Objective #5 of their [State 911 Plan](#), they establish a goal:
"...in consultation with PSAPs, the adoption of the NENA i3 standards for PSAP cybersecurity, as well as establishing a planned migration to the [TFOPA EC3 concept](#) for cybersecurity."

CHAPTER 9: YOUR STATE PLAN'S Data Development, Maintenance & Support Section

Considerations & Best Practices

This section should address the following elements of your state's 911 current and future environments:

- Data management technical system support;
- GIS;
- Call routing and delivery; and
- Data synchronization.

Within each of these topics, objectives toward moving from current to future state should be described and the 911 stakeholder partners with which you will need to collaborate should be identified. In the subsections below, we list considerations for inclusion under each topic.

Data Management Technical System Support

- Roles and responsibilities for operating and maintaining data management systems.

Data is the Lifeblood of NG911!

Technical infrastructure and database management expertise is needed to support the mission of states to create an accurate, interoperable and interconnected system of systems. Therefore, it is critical that the state consider who or what entity will provide such support. As for the state authority's roles and responsibility for operating and maintaining data systems, the National 911 Program's *Next Generation 911 (NG9-1-1) Interstate Playbook, Chapter 2* lists them as follows:

- Project manager;
- Educator and consensus builder for statewide or regionwide collaboration;
- Aggregator and validator of data from multiple sources;
- Initiation, development and maintenance of data standards and workflows;
- Communication with neighboring state and regional jurisdictions;
- Repository of statewide datasets;
- Provider of data portal and portal access/security, if applicable;
- Collaborator with other states to agree on a common data standard for data exchange between states that is based on NENA standards; and
- Creator and maintainer of agreements when GIS Data Model standard is complete.

GIS

- GIS data currently collected or available (if any);
- NG911 dataset creation;
- Formatting GIS data for Location Verification Function (LVF), Emergency Call Routing Function (ECRF), and Policy Routing Function (PRF); and
- Export of jurisdictional boundaries to neighboring ESInets.

Be a GIS Steward!

As identified in the National 911 Program's *Next Generation 911 (NG9-1-1) Interstate Playbook, Chapter 2*, some common approaches to the plethora of responsibilities related to 911 geospatial data stewardship (i.e., creating, managing, storing, updating, correcting, and coalescing GIS data) are provided in the figure below which illustrates data stewardship and provides a structure of considerations for further discussion at the state, regional, or local level. The Playbook goes on to define the roles and responsibilities at the state, county/municipal/PSAP, regional, tribal, and federal levels.

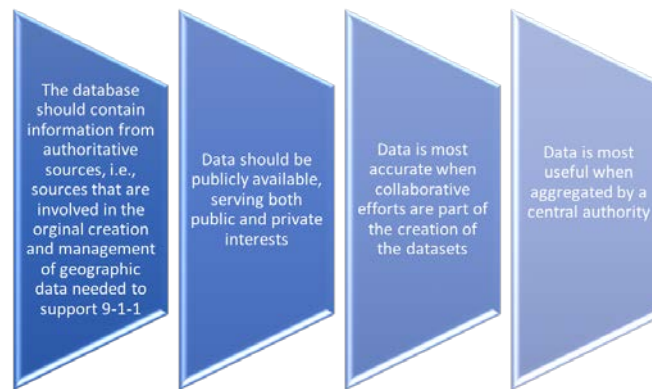


Figure 11: Graphic Used by the National 911 Program to Describe GIS Data Stewardship

The National 911 Program's Playbook also illustrates the significance of, and provides guidance to, cross-jurisdictional collaboration. Response boundaries often cross jurisdictional boundaries, necessitating ongoing collaboration between jurisdictions for agreement on response boundaries to ensure appropriate resources are dispatched. The response to an emergency event often crosses jurisdictional boundaries and/or requires resources from surrounding jurisdictions for support through mutual aid—both scenarios strengthen the need for cross-jurisdictional collaboration. Prior to NG911, collaboration of GIS organizations between and among jurisdictions has not received the same priority of importance. Due to the requirements of GIS data in a NG911 system, lack of collaboration no longer can be overlooked and must be strengthened to create contiguous geospatial datasets.

Call Routing & Delivery

- Selective ESN routing;
- IP-selective ESN routing;
- Geospatial routing (using best available location);
- Automatic location identification (ALI) database management system (DBMS); and
- Location information server (LIS).

Data Synchronization

- Synchronization and standardization of Master Street Address Guide (MSAG) and ALI data with GIS road centerlines, site-structure data, and other related spatial data.

Be PSAP-Proper!

An essential element of NG911 is geospatial call routing, which sends 911 calls to the proper PSAP based on the coordinates of the caller's actual geographic location. Geospatial call routing is an improvement over the traditional 911 call routing process, which bases 911 call routing on tabular lists of address ranges or the approximate location of the cell tower receiving the cell call. For NG911 call routing to operate properly, operational processes need to be put in place to maintain a high-level of synchronization between each PSAP's MSAG, the automatic location identification database (ALI Database) and the GIS data sets. 911 and GIS will need to work together to synchronize and validate these data sources. Furthermore, I3 standards provide for policy routing rules that may be customized by PSAPs to update their desired call routing. Like geospatial call routing, policy routing rules need to be included in the NGCS contract and made available so that PSAPs are aware of any potential routing conflicts. After the implementation of geospatial routing, ongoing data maintenance will be required and PSAPs will need to assume a primary role in resolving errors within these data sources. 911 authorities, in conjunction with GIS data management agencies, will need to develop and propose statewide policy for maintaining GIS quality metrics. Data policy should be established that describes the agreed-upon frequency of data updates. The state authorities should discuss and agree on an established process and timeline for updates and identify the responsible parties for carrying out the updates. Communication between the states or authorities should be frequent, and adherence to the policy should be documented.

Commit Resources!

Best practice guidance calls for synchronization and standardization of MSAG and ALI data with GIS road centerlines, site-structure data, and other related spatial data. This activity is part of any transition planning that a state, region, or local entity conducts to prepare for NG911 implementation. Resources should be committed, and the appropriate related state and local agencies engaged to participate and align efforts.

Beyond the Border!

Who can update or change data should be determined by the state or local 911 authority. The National 911 Program's *Next Generation 911 (NG9-1-1) Interstate Playbook, Chapter 2* notes that this can be done either internally (by state or local entity personnel) or externally (through a contractor). Identifying who has access to the data and how current and complete the data is must be determined and understood. Where there is a need to provide emergency response beyond the jurisdiction's border, the 911 authority needs sufficient information and a mechanism in place to require notification of any updates, changes, or spatial features that will have an impact on call routing. Because of the way telephone exchange boundaries frequently overlay the state boundary line, the need to build the coverage area of GIS data, commonly referred to as a buffer layer, across the border will exist. It is especially important when transitioning to NG911. The need to agree upon the common border with a neighboring state absolutely needs to be coordinated and is strongly encouraged. NG911 data should be maintained to the current standard described in the *NENA NG911 GIS Data Model*. Additionally, determination of data update frequency must be agreed upon by all participating entities and the NG911 call-routing provider. Accuracy benchmarks should include agreed-upon cycles, topology rules, synchronization between legacy 911 databases during migration to a NG911 system, and insurance of mandatory attribution to all required NG911 GIS data layers utilized within the NG911 call-processing system.

State Examples

GIS

- The **State of Michigan** understands the importance of using GIS data currently collected or available as a means of leveraging what has already been invested by the state. One of the critical considerations in their [State 911 Plan](#) notes:
"Existing state-wide GIS data services should be considered for database sharing across the network using centralized databases while existing systems should be interfaced as deemed necessary."
- While the **State of Nebraska's** [National Information Technology Commission \(NITC\) GIS Council](#) is tasked, by statute, to develop statewide policies and standards to help guide the acquisition and sustainability of the core Nebraska Spatial Data Infrastructure (NESDI) framework layers, the PSC [Next Generation 911 Master Plan](#) for the state recognizes that within these core layers are the street centerline, address, and metadata standards that relate directly to the NG911 efforts of the Public Service Commission's vision for the state. In 2012, the NITC commissioned the development of a statewide geospatial strategic plan. This plan identified several key areas for improvement within the Nebraska GIS program including the development and subsequent maintenance of a seamless street centerline and address referencing system. As a result of the recommendations therein, NITC formed the Street Centerline Address Database working group to focus on providing an authoritative dataset for all programs requiring spatial street centerlines. Under the supervision of the 911 GIS Specialist, the PSC has migrated NG911 data collection, storage, and dissemination from an unreliable third-party hosted solution to the Nebraska Office of the Chief Information Officer (OCIO) GIS enterprise data warehouse for the near-term. This migration allowed the PSC greater control over the data processes and drastically improved the quality of service experience for the PSC stakeholder community.
- Accurate GIS data is essential. The **State of Minnesota** [Next Generation 9-1-1 Strategic Plan](#) describes the importance of this in the following way:
"In the NG environment GIS changes from a storage and mapping system to a key routing component. This change precipitates a review of GIS data management as boundary precision requirements are much higher for routing calls and much higher point precision is required to support the NG vision (e.g. the ability to access structure floor plans and support data)."
- The **State of Iowa** started its NG911 GIS work by forming a work group of local 911/GIS stakeholders, including the private sector. In order to create the Iowa GIS standards, the work group analyzed existing state standards as well as the NENA draft that was current at the time. Simultaneously, the state 911 program contracted with a vendor to manage the aggregated statewide data and provided a portal for local jurisdictions for uploads. To foster better local data development, the program was able to offer GIS-specific grants to local 911 service boards in order to stimulate GIS data creation, remediation, and maintenance. The Iowa Department of Homeland Security and Emergency Management included NG911 GIS guidelines (e.g., contractor information, standards, compliance, funding, implementation architectures) in its [Wireless NG911 Implementation and Operations Plan](#).

State Examples (cont.)

Call Routing & Delivery

- According to the PEMA's [Statewide 9-1-1 Plan](#) for the **Commonwealth of Pennsylvania**:

“Established commercial systems are designed to take full advantage of the location and routing capabilities provided by IP-based technology. Establishing a Commonwealth-wide ESInet provides the IP-based transport mechanism necessary to support the functions available for 9-1-1 call routing. The static database design is being replaced with a location-verification process intended to pinpoint the exact location of a caller, from a city high-rise to a remote corner of a state forest-and everywhere in between, regardless of the device being used to call.”

Their viewpoint is aligned with the national perspective on static datasets and highlights the need for statewide dataset development.

PEMA also identifies one of their primary Guiding Strategies related to 911 call routing. The strategy assigns responsibility to PEMA which commits to:

“...design, deploy, and take ownership of the call-delivery function in the Commonwealth. Additionally, PEMA will coordinate GIS collaboration necessary to establish a public safety-grade GIS database capable of location-based routing for 9-1-1 calls. Providing an appropriate transition for a functional NG9-1-1 platform is necessary to support mainstream communications technology and expectations.”

CHAPTER 8: YOUR STATE PLAN'S Analysis & Planning Section

Considerations & Best Practices

This section should address the following elements of your state's 911 current and future environments:

- 911 data analytics; and
- Disaster recovery and Continuity of Operations Plan (COOP).

Within each of these topics, objectives toward moving from current to future state should be described and the 911 stakeholder partners with which you will need to collaborate should be identified. In the subsections below, we list considerations for inclusion under each topic.

911 Data Analytics

- Call trends, e.g., volume, caller demographics, impact of jurisdictional events or emergency situations, fake calls;
- Quantitative and qualitative performance measurement, e.g., call handling, call-to-dispatch efficiency;
- Performance measurement of systems in place, e.g., accuracy of caller location identification; and
- Cost analyses, e.g., cost per call, return on investments (technical and operational), funding needs.

Get Ready for More Data!

Data is going to dramatically change the public safety landscape (actually, it is already changing). More data elements are coming into the 911 center and more data is associated with the 911 request. This will continue as NG911 systems are implemented. IP technology creates the opportunity for additional data elements to be associated with the voice transmission of the 911 call. It will be incumbent on states and local 911 authorities to harness the power of additional data to improve response critical incidents. Applying data analytics and smartly managing all that data will become the responsibility of the 911 authority in the state. Policy related to how the data is collected, stored, managed, integrated into the call flow and record, and used as part of call analysis will need to reflect state legal requirements related to data and the needs of public safety to use such data.

1471 911 Data Analytics (cont.)

1472 Build Smarter Systems!

1473 From the outset, the issue of increased data has never been about the availability of data, but rather the integration of
1474 data from disparate sources (and sorting through all of it for what is most relevant). Without a common data repository,
1475 911 will lack a comprehensive view of trends, problems, or linked events. This becomes even more significant in NG911
1476 as requests can be moved from agency to agency because overflow traffic can be preprogrammed for transmission to
1477 neighboring and partnering agencies. Such a scenario may occur when events occur in different areas of a given
1478 jurisdiction or in neighboring jurisdictions. Making connections between seemingly unrelated data sets is difficult and
1479 must be planned. It also is difficult to mine and analyze data and to identify patterns as quickly as 911 needs arise.
1480 Evolving to this level of capability demands a transformation in thinking, approach, and technologies for public safety
1481 agencies.

1482 Trends Tell You Tons!

1483 Data analytics has the potential to make call processing and call response more effective by detecting trends and
1484 patterns within and across huge volumes of data—a process that still is largely manual. The human factors of intuition,
1485 judgement, and experience will not become irrelevant, but human decision makers need to be provided actionable
1486 intelligence that will allow them to intervene more quickly and prepare a more holistic response in the hope of improving
1487 outcomes.

1488 NG911 Capabilities to the Rescue!

1489 NG911 is the vehicle that will allow additional data to be associated with the 911 call. As NG911 systems are planned
1490 and as transition from legacy to NG911 systems occur, the state and its stakeholders cannot ignore the implications or
1491 the opportunities that come with additional data. What to do about the additional data, i.e., how to collect it, how to
1492 manage it, and how to use it should become an integral part of planning, policy, and statewide standards.

1493 Disaster Recovery & COOP

- 1494
- Protocols, procedures, and plans for sustaining services (technical and operations) during any
- 1495 hazard or potential disruption.

1496 Go Toward the Guidance!

1497 Federal guidance on COOP planning can be found in the DHS [*National Emergency Communications Plan*](#) and the [*FEMA*](#)
1498 [*Continuity Plan Template and Instructions for Non-Federal Governments*](#). NENA offers several courses to assist PSAPs in
1499 disaster planning, including [*Continuity of Operations Plans for PSAPs*](#), [*Disaster Planning for PSAPs*](#), and [*Advanced*](#)
1500 [*Disaster Planning for PSAPs*](#).
1501

1502 Don't Let COOP Plans Collect Dust!

1503 Plans have to be revised, rewritten, and retested when NG911 is implemented—the entire framework for preparedness
1504 and recovery will change. All processes and procedures need to reflect technical, operational, and policy changes
1505 spurred by NG911 implementations. Additionally, the state will likely play a significant role in assisting local 911
1506 authorities with updating their plans.

State Examples

Data Analytics

- The **District of Columbia's** [Integrated Health Care Collaborative](#) project was aimed at identifying recommendations and strategies to more efficiently target the delivery of emergency medical services and connect patients to comprehensive healthcare. Given that the District's data consistently revealed that, on an annual basis, the District has recently been in the top ten cities with the highest 911 call volume in the country, the District sought to evaluate whether the use of nurse triage lines within 911 call centers would help address trends that showed an overuse of 911 by patients with non-emergent conditions. This model would entail the use of data analysis algorithms for focused screening of patients. Through data analysis and research, the project's subcommittee suggested that:

"With this model, which draws on a clinical decision support, 9-1-1 call takers screen calls and redirect lower acuity calls to triage nurses for further assessment. With the guidance of algorithmically driven protocols, a nurse is able to further assess and direct a caller toward non-ED [Emergency Department] outcomes including self-care advice, non-EMS transport to primary care clinics or even an urgent care center. In some cases, the nurse may recommend a standard EMS transport to an ED. The common practice of the various jurisdictions already employing this model is to categorize 9-1-1 calls from highest acuity to lowest acuity, and to then determine the resource type to be deployed, if at all."
- The **State of California's** [Routing on Empirical Data \(RED\)](#) project (conducted in partnership with Public Safety Network) entailed a proof of concept to gather and analyze call data for the 20 busiest wireless sectors routed to the 24 California Highway Patrol (CHP) Ventura Communication Center. The problem the project aimed to address was the high percentage of busy signals experienced due to the exponential increase in wireless phones used to make 911 calls. As an outcome of the project, the state identified one of the solutions to the issue as "Collaborating to Better Use Existing Data:"

"The Routing on Empirical Data (RED) Project conceptualized, designed, and implemented innovative methods to analyze E9-1-1 call data and identify essential data on E9-1-1 call location and the corresponding location of cellular towers. The wireless caller's location (as reported by the caller's cell phone) and cell tower location was used to determine the jurisdiction in which calls originated to optimize routing on more than 140,000 wireless sectors in the State. This data was needed to convince stakeholders to reroute cellular 9-1-1 calls directly to local PSAPs, dramatically reducing 9-1-1 system busies. To reroute cell sectors, the RED Project required:

 - *collection of E9-1-1 Call Data Records (CDR), development of jurisdictional*
 - *shape files to make a visual representation showing which jurisdiction received*
 - *the most calls in a sector.*
 - *PSAPs and County Coordinators agreeing to accept additional cell sectors.*
 - *CHP to relinquish authority of the agreed cell sectors to the local PSAP."*
- In 2016, **NoVA Fire and EMS** set forth to use data analysis to assess their performance of operations at a variety of levels, aiming to identify how they performed against the National Fire Protection Association's (NFPA) 1710 standard for the calendar year of 2015. As part of this assessment, NoVA Fire and EMS sought to identify gaps in its staffing levels and deployment capabilities. Data that resulted from analyses of these areas were then used to assess how conditions that affect the two areas of capability contribute to any needs for improvement. NoVA Fire and EMS analyzed areas including response times in relation to station locations and minimum training and certification requirements. Analyses conducted during each phase are documented via two reports: [Northern Virginia Fire and EMS Assessment Gap Analysis Report](#) and [Northern Virginia Fire and EMS Assessment Gap Analysis Report Phase II](#).

State Examples (cont.)

Disaster Recovery & COOP

- The **State of Minnesota** requires that each PSAP have a COOP and PSAPs must submit them to the ECN Standard and Training Coordinator. The state provides PSAPs with a fillable template and online training to help with COOP development. PSAP COOPs are filed with their 911 plans .
- The **State of Nebraska's** [Next Generation 911 Master Plan](#) devotes a section to Continuity of Operations and Disaster Recovery. The state has adopted a proactive approach to protect information technology that serves state agencies and higher education. The NITC, in concert with the OCIO, has developed standards and guidelines that are intended to protect the state's systems. These standards are applied to 911 systems and PSAPs to enhance resilience to cyber threats that could adversely impact the emergency communications systems.
- Goal #5 of the **Commonwealth of Virginia's** [Statewide 9-1-1 Comprehensive Plan](#) addresses their attention to protecting the reliability and security of the 911 system. One of their initiatives in this area is to provide resources to:
"Support 9-1-1 center staff in formalizing COOPs for their respective PSAP."
- The TECB is in the process of establishing best practices for conducting regularly scheduled reviews of existing alternate routing plans (e.g., annual audits as part of the initiatives in the [Strategic Plan](#) for the **State of Tennessee**). The best practices will include review of each PSAP's Overflow, Disaster, and Maintenance plans. Additionally, a regular schedule and criteria for when the best practices will be applied will be included in the processes. At a minimum, the reviews should occur after major provisioning changes are made, in addition to regularly scheduled audits.

Appendices

Appendix 1: 911 Terms & Definitions

TERM	DEFINITION
911 (or 9-1-1)	A three-digit telephone number to facilitate the reporting of an emergency requiring a response by a public safety agency.
911 authority	A state, county, regional, or other governmental entity responsible for 911 service operations. For example, this could be a county/parish or city government, a special 911 or Emergency Communications District, a Council of Governments or other similar body.
911 “call”	A generic term used to include any type of Request For Emergency Assistance (RFEA); and is not limited to voice. This may include a session established by signaling with two way real-time media and involves a human making a request for help. We sometimes use “voice call”, “video call” or “text call” when specific media is of primary importance. The term “non-human-initiated call” refers to a one-time notification or series of data exchanges established by signaling with at most one way media, and typically does not involve a human at the “calling” end. The term “call” can also be used to refer to either a “Voice Call”, “Video Call”, “Text Call” or “Data-only call”, since they are handled the same way through most of NG9-1-1.
911 fund	The fund established by state statute that is specifically used to fund 911 activities and/or infrastructure.
911 service area	The geographic area that has been granted authority by a state or local governmental body to provide 911 services.
911 state plan	A document prepared, maintained, implemented, and updated by a state that provides a comprehensive plan for operating a statewide 911 system that communicates 911 call information across networks and among PSAPs, addresses all aspects of the statewide 911 system, and describes the allowable uses of revenue in the 911 fund.
911 system	A coordinated system of technologies used by a collaborative group of people to operate an efficient and effective network for accepting, processing, and delivering emergency information to facilitate an emergency response. A set of networks, software applications, databases, customer premises equipment (CPE) components, and operations and management procedures required to provide 911 service. This may include commercial, governmental, and human resources.
Access provider	An access provider is any organization that arranges for an individual or an organization to have access to the internet.
Additional data	Data that further describe the nature of how a call was placed, the person(s) associated with the device placing the call, or the location the call was placed from. There are three types of Additional Data: Additional Data for the Call, Additional Data for the Caller, and Additional Data for the Location.
Agency	In NG911, an organization that is connected directly or indirectly to the ESInet. Public safety agencies are examples of Agency. An entity such as a company that provides a service in the ESInet can be an Agency. Agencies have identifiers and credentials that allow them access to services and data.

TERM	DEFINITION
Agent	In NG911, an Agent is an authorized person—an employee, contractor or volunteer, who has one or more roles in an Agency. An Agent can also be an automaton in some circumstances (e.g. an IMR answering a call).
Alternate routing	The capability of routing 9-1-1 calls to a designated alternate location(s) if all 9-1-1 trunks are busy or out of service. May be activated upon request or automatically, if detectable, when 9-1-1 equipment fails or the PSAP itself is disabled.
Automatic location identifier (ALI)	The automatic display at the PSAP of the caller’s address/location of the telephone and supplementary emergency services information of the location from which a call originates.
Automatic Number Identification (ANI)	The automatic display at the PSAP of the caller’s telephone number associated with the access line from which a call originates.
Basic 911	An emergency telephone system which automatically connects 911 callers to a designated answering point. Call routing is determined by the originating telephone central office only. Basic 911 may or may not support ANI and/or ALI.
Call-taker	An agent of a PSAP who answers and processes emergency calls. Synonymous with the term, “Telecommunicator.”
Call-taking	The act of processing a call for emergency assistance up to the point that the call is ready for dispatch, including the use of equipment, call classification, location of a caller, and determination of the appropriate response level for emergency responders.
Call handling	Functional element concerned with the details of the management of calls. It handles all communication from the caller. It includes the interfaces, devices and applications utilized by the Agents to handle the call.
Call routing	The capability to selectively route the 9-1-1 call to the appropriate PSAP.
Carrier	A function provided by a business to a customer base, typically for a fee. Examples of carriers and associated services are PSTN service by a local exchange carrier, Voice over Internet Protocol (VoIP) service by a VoIP provider; e-mail service provided by an Internet service provider.
Commercial call center	A privately operated call center, which answers emergency and/or nonemergency calls.
Commercial mobile radio service (CMRS)	An FCC designation for any carrier or licensee whose wireless network is connected to the public switched telephone network.
CMRS connection	Each mobile handset telephone number assigned to a CMRS subscriber with a place of primary use in-state.
CMRS provider	An entity, whether facilities-based or non-facilities-based, that is licensed by the Federal Communications Commission to provide CMRS or that resells CMRS within a state.
Computer-aided Dispatch (CAD)	A computer-based system that aids PSAP telecommunicators by automating selected dispatching and record keeping activities.
Continuity of Operations (COOP)	The ability to continue operations during and after a service impacting event through a specific set of procedures designed to reduce the damaging consequences of unexpected events resulting in the loss of 911 capabilities.
Customer premise equipment (CPE)	Communications or terminal equipment located in the customer’s facilities—terminal equipment at a PSAP.

TERM	DEFINITION
Database	An organized collection of information, typically stored in computer systems, comprised of fields, records (data), and indexes. In 911, such databases include Master Street Address Guide (MSAG), telephone number/Emergency Service Number (ESN), and telephone customer records.
Data exchange	The process of exchanging 911 data between service providers and the database management system provider.
Dispatch system	Functional element used to assign appropriate resources (emergency responders) to an incident, monitor the response and relay relevant information. Tracks and logs all transactions associated with the emergency response.
Enhanced 911 (E911)	A telephone system that includes network switching, database and PSAP premise elements capable of providing automatic location identification data, selective routing, selective transfer, fixed transfer, and a call-back number. The term also includes any enhanced 911 service so designated by the Federal Communications Commission in its Report and Order in WC Docket Nos. 04-26 and 05-196, or any successor proceeding.
Emergency Medical Services	A service providing out-of-hospital acute care and transport to definitive care, to patients with illnesses and injuries which the patient believes constitute a medical emergency.
Emergency services IP network (ESInet)	An ESInet is a managed IP network that is used for emergency services communications, and which can be shared by all public safety agencies. It provides the IP transport infrastructure upon which independent application platforms and core services can be deployed, including, but not restricted to, those necessary for providing NG9-1-1 services. ESInets may be constructed from a mix of dedicated and shared facilities. ESInets may be interconnected at local, regional, state, federal, national and international levels to form an IP-based inter-network (network of networks). The term ESInet designates the network, not the services that ride on the network.
First Responder Network Authority (FirstNet)	Signed into law on February 22, 2012, the Middle Class Tax Relief and Job Creation Act created the First Responder Network Authority (FirstNet). The law gives FirstNet the mission to build, operate and maintain the first high-speed, nationwide wireless broadband network dedicated to public safety. FirstNet will provide a single interoperable platform for emergency and daily public safety communications. http://www.firstnet.gov/
Geographic information Systems (GIS)	A system for capturing, storing, displaying, analyzing and managing data and associated attributes which are spatially referenced.
i3 Solution	NENA i3 introduces the concept of an Emergency Services IP network (ESInet), which is designed as an IP-based inter-network (network of networks) shared by all agencies which may be involved in any emergency.
Interlocal services agreement	An agreement among governmental jurisdictions or privately owned systems, or both, within a specified area to share 911 system costs, maintenance responsibilities, and other considerations.
Internet protocol (IP)	The method by which digital data is sent from one computer to another on the Internet or other networks.
Interoperability	The capability for disparate communications systems to seamlessly interconnect and work together as a collective system.
Landline	Colloquial term for the public switched telephone network access via an actual copper or fiber optic transmission line that travels underground or on telephone poles. Used to differentiate the “wireless” connectivity of a cellular or Personal Communication System.
Legacy network gateway (LNG)	An NG911 functional Element that provides an interface between a non-IP originating network and a Next Generation Core Services (NGCS) enabled network.

TERM	DEFINITION
Legacy PSAP gateway (LPG)	The Legacy PSAP Gateway (LPG) is a signaling and media interconnection point between an ESInet and a legacy PSAP. It plays a role in the delivery of emergency calls that traverse an i3 ESInet to get to a legacy PSAP, as well as in the transfer and alternate routing of emergency calls between legacy PSAPs and NG9-1-1 PSAPs. The LPG supports an IP (i.e., SIP) interface towards the ESInet on one side, and a traditional MF or Enhanced MF interface (comparable to the interface between a traditional Selective Router and a legacy PSAP) on the other.
Local exchange carrier	A telecommunications carrier under the state/local Public Utilities Act that provides local exchange telecommunications services. Also known as incumbent local exchange carriers, alternate local exchange carriers, competitive local exchange carriers, competitive access providers, certified local exchange carriers, and local service providers.
Location information server (LIS)	A functional element in an IP-capable originating network that provides locations of endpoints (i.e., calling device). A LIS can provide Location by-Reference, or Location-by-Value, and, if the latter, in geo or civic forms. A LIS can be queried by an endpoint for its own location, or by another entity for the location of an endpoint. In either case, the LIS receives a unique identifier that represents the endpoint, for example an IP address, circuit-ID or Media Access Control (MAC) address and returns the location (value or reference) associated with that identifier. The LIS is also the entity that provides the dereferencing service, exchanging a location reference for a location value.
Master Street Address Guide (MSAG)	A database of street names and house number ranges within their associated communities defining emergency service zones (ESZs) and their associated emergency service numbers (ESNs) to enable proper routing of 911 calls.
Memorandum of Agreement (MOA)	A memorandum of agreement or cooperative agreement is a document written between parties to cooperatively work together on an agreed upon project or meet an agreed upon objective.
Memorandum of Understanding (MOU)	A memorandum of understanding is a document that expresses mutual accord on an issue between two or more parties.
Mutual aid agreement	Written agreement between agencies and/or jurisdictions in which they agree to assist one another upon request, by furnishing personnel and equipment.
National Information Exchange Model (NIEM)	A community-driven, standards-based, national model for structured information sharing. www.niem.gov
National Incident Management System (NIMS)	A standardized approach to incident management developed by the U.S. Department of Homeland Security. It is intended to facilitate coordination between all responders (including all levels of government with public, private, and non-governmental organizations). https://www.fema.gov/national-incident-management-system
Next Generation 911 (NG911) services	"Next Generation 9-1-1 services" means a secure, IP-based, open standards system comprised of hardware, software, data, and operational policies and procedures that: <ul style="list-style-type: none"> a) provides standardized interfaces from emergency call and message services to support emergency communications; b) processes all types of emergency calls, including voice, text, data, and multimedia information; c) acquires and integrates additional emergency call data useful to call routing and handling; d) delivers the emergency calls, messages, and data to the appropriate public safety answering point and other appropriate emergency entities based on the location of the caller; e) supports data, video, and other communications needs for coordinated incident response and management; and f) interoperates with services and networks used by first responders to facilitate emergency response. <i>REF: Agreed to by NENA, NASNA, iCERT, and the National 9-1-1 Office representatives on 01/12/2018.</i>

TERM	DEFINITION
Order of authority	A formal order by the state or local authority which authorizes public agencies or public safety agencies to provide 911 service in a geographical area.
Prepaid wireless telephone service	Telephone service authorized by the purchase of CMRS, either exclusively or in conjunction with other services. This service must be paid for in advance and is sold in units or dollars whose number or dollar value declines with use and is known on a continuous basis.
Private 911 Emergency Answering Point	An answering point operated by nonpublic safety entities with functional alternative and adequate means of signaling and directing response to emergencies. Includes training to individuals intercepting call for assistance that is in accordance with applicable local emergency telecommunications requirements. Private 911 emergency answering points are an adjunct to public safety response and as such must provide incident reporting to the public safety emergency response centers per local requirements.
Proprietary information	Subscriber lists, technology descriptions, technical information, or trade secrets that are developed, produced, or received internally by a voice communications service provider or by a voice communications service provider's employees, directors, officers, or agents.
Public safety agency	A functional division of a public agency that provides firefighting, police, medical or other services to respond to and manage emergency incidents.
Public safety answering point (PSAP)	<p>An entity responsible for receiving 911 calls and processing those calls according to a specific operational policy.</p> <ul style="list-style-type: none"> • Primary PSAP: A PSAP to which 911 calls are routed directly from the 911 Control Office. • Secondary PSAP: A PSAP to which 911 calls are transferred from a primary PSAP. • Alternate PSAP: A PSAP designated to receive calls when the primary PSAP is unable to do so. • Consolidated PSAP: A facility where multiple public safety agencies choose to operate as a single 911 entity. • Legacy PSAP: A PSAP that cannot process calls received via i3-defined call interfaces (IP-based calls) and still requires the use of CAMA or ISDN trunk technology for delivery of 911 emergency calls. • Serving PSAP: The PSAP to which a call would normally be routed. • NG911 PSAP: This term is used to denote a PSAP capable of processing calls and accessing data services as defined in NENA's i3 specification, NENA NENA-STA-010, and referred to therein as an "i3 PSAP."
Service provider	An entity providing one or more of the following 911 elements: network, CPE, or database service.
Standards development organization (SDO)	An entity whose primary activities are developing, coordinating, promulgating, revising, amending, reissuing, interpreting, or otherwise maintaining standards that address the interests of a wide base of users outside the standards development organization.
Subscriber	A person who purchases a communications service and is able to receive it or use it periodically over time.
Telecommunication	The transmission, between and among points specified by the user, or information of the user's choosing, without change in the form of content of the information sent and received, regardless of the facilities, equipment or technology used.
Telecommunicator	Person employed by a PSAP and/or an EMD service provider qualified to answer incoming emergency telephone calls and/or provides for the appropriate emergency response either directly or through communication with the appropriate PSAP.

TERM	DEFINITION
Virtual PSAP	An operational model directly enabled through NG911 features and/or network hosted PSAP equipment in which telecommunicators are geographically dispersed, rather than working from the same physical location. Remote access to the PSAP applications by the dispersed telecommunicators requires the appropriate network connections, security, and work station equipment at the remote location. Unified communications applications supporting voice, data, instant messaging, and video communications between telecommunicators may be used to enable the telecommunicators to work cooperatively from diverse locations. The virtual work place may be a logical combination of physical PSAPs, or an alternate work environment such as a satellite facility, or any combination of the above. Workers are connected and interoperate via IP connectivity.
Voice communications service	The transmission, conveyance, or routing of real-time two-way voice communications to a point or between or among points or through any electronic, radio, satellite, cable, optical, microwave, wireline, wireless, or other medium or method, regardless of the protocol used, including interconnected VoIP service.
Voice over Internet protocol (VoIP)	Technology that permits delivery of voice calls and other real-time multimedia sessions over IP networks.

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Appendix 2: Associations, Organizations & Other Stakeholder Entities Relevant to 911

NAME/ACRONYM	DESCRIPTION	WEBSITE
American National Standards Institute (ANSI)	Entity that coordinates the development and use of voluntary consensus standards in the United States and represents the needs and views of U.S. stakeholders in standardization forums around the globe.	www.ansi.org
Association of Public Safety Communications Officials (APCO)	APCO is the world's oldest and largest not-for-profit professional organization dedicated to the enhancement of public safety communications.	http://www.apcointl.org/
American Registry for Internet Numbers (ARIN)	An organization that provides services related to the technical coordination and management of Internet number resources.	https://www.arin.net/
Alliance for Telecommunications Industry Solutions (ATIS)	A U.S.-based organization that is committed to rapidly developing and promoting technical and operations standards for the communications and related information technologies industry worldwide using a pragmatic, flexible and open approach.	www.atis.org
Commission on Accreditation for Law Enforcement Agencies (CALEA)	<p>Created in 1979 as a credentialing authority through the joint efforts of law enforcement's major executive associations:</p> <ul style="list-style-type: none"> • International Association of Chiefs of Police (IACP); • National Organization of Black Law Enforcement Executives (NOBLE); • National Sheriffs' Association (NSA); and the • Police Executive Research Forum (PERF). <p>The purpose of CALEA's Accreditation Programs is to improve the delivery of public safety services, primarily by: maintaining a body of standards, developed by public safety practitioners, covering a wide range of up-to-date public safety initiatives; establishing and administering an accreditation process; and recognizing professional excellence.</p>	http://www.calea.org/
Communications Security, Reliability, and Interoperability Council (CSRIC) (formerly known as the Network Reliability and Interoperability Council [NRIC])	An advisory body of the FCC which provides recommendations to the FCC to ensure, among other things, optimal security and reliability of communications systems, including telecommunications, media, and public safety.	https://www.fcc.gov/about-fcc/advisory-committees/communications-security-reliability-and-interoperability-council-0

NAME/ACRONYM	DESCRIPTION	WEBSITE
Emergency Services Interconnection Forum (ESIF)	An open, technical/operational forum, under the auspices of the Alliance For Telecommunications Industry Solutions, with the voluntary participation of interested parties to identify and resolve recognized 911 interconnection issues. “The interest of all members will be served by observing the principles of openness, fairness, consensus, and due process. ESIF will liaise with standards and governmental organizations to apprise them of its deliberations and decisions. Discussions will be focused on the FCC’s Wireless Phase I and II mandates, and into other areas of emergency services interconnection.”	www.atis.org/esif
Federal Communications Commission (FCC)	An independent U.S. government agency overseen by Congress, the Federal Communications Commission regulates interstate and international communications by radio, television, wire, satellite and cable in all 50 states, the District of Columbia and U.S. territories.	https://www.fcc.gov/
Federal Geographic Data Committee (FGDC)	The Federal Geographic Data Committee (FGDC) is an interagency committee that promotes the coordinated development, use, sharing, and dissemination of geospatial data on a national basis.	https://www.fgdc.gov/
First Responder Network Authority (FirstNet)	Signed into law on February 22, 2012, the Middle Class Tax Relief and Job Creation Act created the First Responder Network Authority (FirstNet). The law gives FirstNet the mission to build, operate and maintain the first high-speed, nationwide wireless broadband network dedicated to public safety. FirstNet will provide a single interoperable platform for emergency and daily public safety communications.	http://www.firstnet.gov/
Internet Architecture Board (IAB)	The IAB is the committee charged with oversight of the technical and engineering development of the Internet by the Internet Society (ISOC). It oversees a number of Task Forces, of which the most important are the Internet Engineering Task Force (IETF) and the Internet Research Task Force (IRTF). The body which eventually became the IAB was originally formed by the United States Department of Defense’s Defense Advanced Research Projects Agency under the name Internet Configuration Control Board in 1979; it eventually became the Internet Advisory Board in September, 1984, and then the Internet Activities Board in May, 1986 (the name was changed, while keeping the same acronym). It finally became the Internet Architecture Board, under ISOC, in January, 1992, as part of the Internet’s transition from a U.S.-government entity to an international, public entity.	https://www.iab.org/
International Academies of Emergency Dispatch	A non-profit standard-setting organization, formerly known as the National Academies of Emergency Dispatch (NAED), promoting safe and effective emergency dispatch services worldwide.	http://www.emergencydispatch.org/

NAME/ACRONYM	DESCRIPTION	WEBSITE
Internet Assigned Numbers Authority (IANA)	IANA is the entity that oversees global IP address allocation; Domain Name System (DNS) root zone management, and other Internet protocol assignments.	www.iana.org
Internet Corporate for Assigned Names and Numbers (ICANN)	Authority for public domain addresses and URLs, including related policies and databases.	https://www.icann.org/
Institute of Electrical and Electronic Engineers (IEEE)	A publishing and standards making body responsible for many telecom and computing standards.	https://www.ieee.org/
Internet Engineering Steering Group (IESG)	The IESG is a body composed of the Internet Engineering Task Force Chair and Area Directors.	https://www.ietf.org/about/groups/iesg/
Internet Engineering Task Force (IETF)	Lead standard setting authority for internet protocols.	https://www.ietf.org/
Integrated Justice Information Systems Institute (IJIS)	The IJIS Institute, a 501(c)(3) nonprofit corporation, represents industry's leading companies who collaborate with local, state, tribal, and federal agencies to provide technical assistance, training, and support services for information exchange and technology initiatives. The mission of the IJIS Institute is to unite the private and public sectors to improve critical information sharing for those who provide public safety and administer justice in our communities.	www.ijis.org
International Committee for Information Technology Standards (INCITS)	A U.S.-based Standards Development Organization dedicated to the creation of information technology standards.	www.incits.org
International Standards Organization (ISO)	An independent, non-governmental international organization with a membership of 161 national standards bodies.	www.iso.org
International Telecommunication Union (ITU)	The telecommunications agency of the United Nations established to provide worldwide standard communications practices and procedures. Formerly the Consultative Committee for International Telephony and Telegraphy (CCITT).	https://www.itu.int/en/Pages/default.aspx
National 911 Program	The National 911 Program's mission is to provide federal leadership and coordination in supporting and promoting optimal 911 services. This federal "home" for 911 plays a critical role by coordinating federal efforts that support 911 services across the nation.	https://www.911.gov/
National Suicide Prevention Lifeline (LIFELINE)	The National Suicide Prevention Lifeline is a national network of local crisis centers that provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.	https://suicidepreventionlifeline.org/

NAME/ACRONYM	DESCRIPTION	WEBSITE
North American Network Operators Group (NANOG)	A governing body that provides guidance and instructions for the design of an IP network. NANOG is typically involved in the best current operational practices for IPv6 planning.	https://www.nanog.org/about/home
North American Numbering Plan Administration (NANPA)	The organization that has overall administrative responsibility of the North American Numbering Plan (NANP), an integrated telephone numbering plan serving 20 North American countries that share its resources.	www.nationalnanpa.com
National Association of Search and Rescue (NASAR)	Non-profit association dedicated to advancement of professional, literary and scientific knowledge and training in the search and rescue field.	http://www.nasar.org/
National Association of State 911 Administrators (NASNA)	An association that represents state 911 programs in the field of emergency communications.	www.nasna911.org
National Center for Missing and Exploited Children (NCMEC)	The National Center for Missing & Exploited Children® opened in 1984 to serve as the nation's clearinghouse on issues related to missing and sexually exploited children.	www.missingkids.com
National Exchange Carrier Association (NECA)	A membership association of U.S. local telecommunications companies dedicated to keeping customers connected on state-of-the-art communications networks.	www.neca.org
National Emergency Number Association (NENA)	The National Emergency Number Association is a not-for-profit corporation established in 1982 to further the goal of "One Nation-One Number." NENA is a networking source and promotes research, planning and training. NENA strives to educate, set standards and provide certification programs, legislative representation and technical assistance for implementing and managing 911 systems.	www.nena.org
National Fire Protection Association	A global nonprofit organization, established in 1896, devoted to eliminating death, injury, property and economic loss due to fire, electrical and related hazards.	www.nfpa.org
National Highway Traffic Safety Administration (NHTSA)	NHTSA is an agency of the Executive Branch of the U.S. government, part of the Department of Transportation. It describes its mission as "Save lives, prevent injuries, reduce vehicle-related crashes." The National 911 Program is housed under NHTSA.	www.nhtsa.gov
National Integration Center (NIC)	The Department of Homeland Security's National Integration Center is responsible for managing the implementation and administration of the National Incident Management System (NIMS).	https://www.fema.gov/fema-technical-assistance-program

NAME/ACRONYM	DESCRIPTION	WEBSITE
National Information Standards Organization (NISO)	NISO, the National Information Standards Organization, a non-profit association accredited by the American National Standards Institute (ANSI), identifies, develops, maintains, and publishes technical standards to manage information in our changing and evermore digital environment. NISO standards apply both traditional and new technologies to the full range of information-related needs, including retrieval, re-purposing, storage, metadata, and preservation.	http://www.niso.org
National Institute of Standards and Technology (NIST)	A part of the United States Department of Commerce that oversees the operation of the U.S. National Bureau of Standards. NIST works with industry and government to advance measurement science and to develop standards in support of industry, commerce, scientific institutions, and all branches of government. Their mission is to promote innovation and industrial competitiveness.	www.nist.gov
National Joint Telecommunicator Emergency Response Taskforce (TERT) Initiative (NJTI)	A partnership between APCO and NENA that has worked to develop the many facets of a TERT program and to help states develop who do not yet have an active TERT program. TERT involves a comprehensive program that includes assistance to individual states in developing programs that would lead to the establishment of predetermined and selected trained teams of individuals who can be mobilized quickly and deployed to assist communications centers during disasters.	www.njti-tert.org
National Telecommunications and Information Administration (NTIA)	NTIA is the executive branch agency that is principally responsible for advising the President on telecommunications and information policy issues. NTIA's programs and policymaking focus largely on expanding broadband Internet access and adoption in America, expanding the use of spectrum by all users, and ensuring that the Internet remains an engine for continued innovation and economic growth.	https://www.ntia.doc.gov/
Organization for Advancement of Structured Information Standards (OASIS)	A standards development organization that promulgates standards for data interchange.	www.oasis-open.org
Open Geospatial Consortium (OGC)	A standards development organization that promulgates standards for the global geospatial community.	http://www.opengeospatial.org/
Open Mobile Alliance (OMA)	A standards development organization which develops standards for the mobile phone industry.	www.openmobilealliance.org
Packet Technologies and Services Committee (PTSC)	PTSC is an ATIS standards committee that develops standards related to services, architectures, signaling, network interfaces, next generation carrier interconnect, cybersecurity, and government emergency telecommunications service within next generation networks.	www.atis.org/PTSC
Urban and Regional Information Systems Association (URISA)	A non-profit association of professionals using GIS and other information technologies to solve challenges in US state and local government agencies.	http://www.urisa.org/

Appendix 3: Useful Resources

Federal Rules, Regulations & Laws

- [*Wireless Communications and Public Safety Act of 1999 \(PL 106-81\)*](#)
- [*Enhance 911 Service Act of 2004 \(PL 108-494\)*](#)
- [*New and Emerging Technologies 911 Improvement Act of 2008*](#)
- [*Food, Conservation and Energy Act of 2008 \(“Farm Bill”\) \(PL 110-246\)*](#)
- [*Implementing Recommendations of the 9/11 Commission Act of 2007 \(PL 110-53\)*](#)

Reports

- FCC TFOPA [*Adopted Final Report*](#)
- TFOPA Working Group 1 Supplemental Report—[*Optimal Cybersecurity Approach for PSAPs*](#)
- TFOPA Working Group 2 Supplemental Report—[*Phase II Supplemental Report: NG9-1-1 Readiness Scorecard*](#)
- TFOPA Working Group 3 Supplemental Report—[*Funding Sustainment Model*](#)
- GAO Report to Congressional Committees: [*911 Services Most States Used 911 Funds for Intended Purposes, but FCC Could Improve Its Reporting on States’ Use of Funds*](#)
- FCC Emergency Access Advisory Committee (EACC) Working Group 7 Report—[*Recommendations on Timeline Alignment*](#)
- Canadian Radio-television and Telecommunications Commission, [*A Report on Matters Related to Emergency 911*](#)

Guidance & Research Documents

- *Guidelines for State NG911 Legislative Language**
- National 911 Program [*State Assessment Handbook: A Guide for States Participating in the Statewide 911 System Assessment Process*](#)
- National 911 Program [*State Assessment Guidelines Synopsis Chart*](#)
- National 911 Program [*Next Generation 911 \(NG911\) Standards Identification and Review*](#)
- [*NG911 & FirstNet: Together Building the Future of Public Safety Communications \(A Guide for State & Local Authorities\)*](#)
- [*Guidelines for Minimum Training*](#)
- National 911 Program [*Next Generation 911 \(NG9-1-1\) Interstate Playbook, Chapter 1*](#)
- National 911 Program [*Next Generation 911 \(NG9-1-1\) Interstate Playbook, Chapter 2*](#)

*Hyperlink will be added once resource is published and posted for public distribution.

1611 **Databases & Resource Repositories**

- 1612 • APCO [Standards to Download](#)
- 1613 • NASNA [How to Start a State 911 Program](#)
- 1614 • NASNA [State 911 Contacts](#)
- 1615 • NASNA 911 [Regionalization—Tools and Information](#)
- 1616 • National 911 [Program Documents & Tools](#)
- 1617 • [National 911 Profile Database](#)
- 1618 • NCSL [Key Enacted 911 Legislation Database](#)
- 1619 • NENA [Company Identifier Program](#)
- 1620 • NENA [Standards & Other Documents](#)